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25

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JOURNAL

Articles

An Unfolding Model of Voluntary Employee Turnover

Thomas W. Lee, Terence R. Mitchell, Lowell Wise, and Steven Fireman

Personal Initiative at Work: Differences Between East and West Germany

Michael Frese, Wolfgang Kring, Andrea Soose, and Jeannette Zempel

Who Shall Succeed? How CEO/Board Preferences and Power Affect the Choice of New CEOs

Edward J. Zajac and James D. Westphal

Corporate Risk-Return Relations: Returns Variability Versus Downside Risk

Kent D. Miller and Michael J. Leiblein

Distinguishing the Effects of Functional and Dysfunctional Conflict on Strategic Decision Making: Resolving a Paradox for Top Management Teams

Allen C. Amason

Socialization Tactics: Longitudinal Effects on Newcomer Adjustment

Blake E. Ashforth and Alan M. Saks

Research Notes

Effects of International Diversity and Product Diversity on the Performance of Multinational Firms

Stephen Tallman and Jiatao Li

CEO Characteristics: Does Industry Matter?

Nandini Rajagopalan and Deepak K. Datta

Hybrid Organizational Arrangements and Their Implications for Firm Growth and Survival: A Study of New Franchisors

Scott A. Shane

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P 10,123

Academy of Management JOURNAL

25

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Academy of Management JOURNAL

658.05
Ac 12

CONTENTS

Volume 39, Number 1, February 1996

- An Unfolding Model of Voluntary Employee Turnover
*Thomas W. Lee, Terence R. Mitchell, Lowell Wise,
and Steven Fireman* 5
- Personal Initiative at Work: Differences Between East and West Germany
*Michael Frese, Wolfgang Kring, Andrea Soose, and
Jeannette Zempel* 37
- Who Shall Succeed? How CEO/Board Preferences and Power Affect
the Choice of New CEOs
Edward J. Zajac and James D. Westphal 64
- Corporate Risk-Return Relations: Returns Variability Versus
Downside Risk
Kent D. Miller and Michael J. Leiblein 91
- Distinguishing the Effects of Functional and Dysfunctional Conflict
on Strategic Decision Making: Resolving a Paradox for Top Manage-
ment Teams
Allen C. Amason 123
- Socialization Tactics: Longitudinal Effects on Newcomer Adjustment
Blake E. Ashforth and Alan M. Saks 149

RESEARCH NOTES

- Effects of International Diversity and Product Diversity on the
Performance of Multinational Firms
Stephen Tallman and Jiatao Li 179
- CEO Characteristics: Does Industry Matter?
Nandini Rajagopalan and Deepak K. Datta 197

Hybrid Organizational Arrangements and Their Implications for Firm Growth and Survival: A Study of New Franchisors <i>Scott A. Shane</i>	216
Style Guide for Authors	235
Special Research Forum Calls for Papers	241

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AN UNFOLDING MODEL OF VOLUNTARY EMPLOYEE TURNOVER

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We report a test of Lee and Mitchell's model of voluntary employee departure from an organization. Data gathered from interviews with nurses who had recently quit their jobs and a mailed survey were analyzed qualitatively via pattern matching and quantitatively through correlations, analysis of medians, log linear modeling, and contingency tables. Although the data generally supported the theory, several nonconfirming cases revealed ambiguities in the model and therefore opportunities for improvement. In general, the data indicated that people use different and distinct psychological processes when leaving an organization and that some of these processes may not be consistent with existing turnover theories. Implications for theory and practice are discussed.

For over 35 years, the ideas of March and Simon (1958) have been the basis for most of the theory and research on voluntary employee turnover, or departure from an organization. Much of this work has focused on the empirical validation of conceptual models that describe the intermediate links between job attitudes and employee turnover. As a result, this research has been paradigm-based and cumulative. However, it can be characterized as somewhat narrow. The major focus has been on how job dissatisfaction leads to leaving. When interest focuses on turnover attributable to other constructs, such as organizational commitment or job involvement, the causal process that induces employees to quit is not as well understood. If interest shifts to non-affect-induced turnover, a process in which nonattitudinal forces prompt employees to quit cannot be articulated with even modest confidence. Thus, the discipline might be fairly criticized as knowing a great deal about a limited portion of a broad organizational phenomenon. In an attempt to expand, as well as to reenergize, this thinking and research, Lee and Mitchell (1994) proposed an alternative model. The purpose of the pres-

We thank Linda McDaniel and Rick Mowday for their comments on earlier drafts. We are also deeply indebted to Amy Warburton for her invaluable assistance in this research.

ent article is to report an initial empirical test of their "unfolding model of voluntary employee turnover."

THE LEE AND MITCHELL MODEL

March and Simon (1958) argued that voluntary employee departure results from a *decision to participate*, which was theorized to derive from two subdecisions about the *perceived ease* and *desirability* of movement. Over time, the perceived ease of movement has evolved to mean perceived job alternatives, and the perceived desirability of movement has evolved to mean job satisfaction. Thus, most of the psychologically oriented research has been driven by a model that holds employee turnover to result from a particular combination of job dissatisfaction and perceived job alternatives (e.g., Mobley, 1977).

Recently, Lee and Mitchell (1994) proposed that image theory (Beach, 1990) can also serve as a conceptual underpinning to voluntary employee turnover. Traditional turnover theories hold that quitting involves three main components. First, job dissatisfaction initiates the process. Second, employees search for alternatives prior to leaving their organizations. Third, people evaluate these alternatives using a subjective expected utility (SEU) decision model. In contrast, image theory suggests that (1) factors other than affect can initiate the turnover process, (2) employees may or may not compare a current job with alternatives, and (3) a compatibility judgment, instead of the subjective expected utility decision model, may be used.

A detailed description of the unfolding model can be found in Lee and Mitchell (1994). As summarized below, the unfolding model's major components include "shocks to the system" and the amount of psychological analysis that precedes a decision to quit and the act of quitting. Shocks are particular, jarring events that initiate the psychological decision processes involved in quitting a job. Moreover, the psychological processes can vary from a quick judgment unencumbered by multiple attributes, to a highly rational, expected-value comparison of alternatives. Four decision paths describe possible combinations of shocks (or no shocks) and the cognitive activities that follow.

Decision Paths

Decision path 1. A shock to the system is theorized to elicit a memory probe for the recollection of a highly similar shock, situation, and response. The recollection may originate from an actual experience or from vicarious learning gained, for instance, by watching others, reading, or social expectations. Regardless of its origin, the recollection requires thought about the circumstances, likely actions given the circumstances, and expected consequences of these actions. The concept in the literature that most closely describes these action plans may be scripts (Fiske & Taylor, 1991). If a relevant past experience or script exists, a match is said to occur, and the response (e.g., staying or leaving) is "enacted." If recollection is absent, a match does not occur, and another decision path may be initiated. Thus, the essential

features of decision path 1 are the presence of a shock and the enactment of a matching script, or preexisting action plan. We saw matching scripts as "*devoted specifically to the retention of the context-specific knowledge about events and event sequences and to the guidance of action on the basis of that knowledge*" (Gioia, 1986: 57). For example, a female employee may have planned in some detail how she would stay home for a few years to raise her first child upon becoming pregnant (a script); when pregnancy actually occurs (a shock), the script is enacted by her actual quitting. It is important to note that the shock need not be surprising or negative.

Decision path 2. A shock prompts an employee to reassess the quality of his or her basic attachment to the organization. The focus is on how much the person wants to be a member of the current organization. Moreover, the reassessment and decision occur in the absence of specific job alternatives and result in the binary outcome of staying or quitting. This decision involves two psychological processes. First, the shock and accompanying situation are judged against three images for compatibility or fit (Beach, 1990). The first image concerns personal values and is called the value image; the second image, called the trajectory image, involves an employee's goals; and the third image, labeled the strategic image, deals with activities directed toward goal attainment. Second, if the shock and information it contains causes the individual to believe there is a misfit among his or her values, goals, and behavioral strategies and the current job situation, he or she simply quits. If no serious discrepancies occur in this comparison process, the employee stays. Thus, the essential features of decision path 2 are a shock and violation of images. For example, a woman is bypassed for promotion (a shock). As a result, she may feel that her career has been seriously hindered (an image violation); she may then decide that she can no longer work for the company and quits.

Decision path 3. A shock to the system signals an employee to assess whether a basic attachment could form with another organization. The focus is on how much she or he wants to leave the current organization. Moreover, these assessments occur in the presence of at least one specific job alternative. Decision path 3 involves three sequential sets of judgments. In the first set, the shock, situation, and three images are again evaluated. In contrast to decision path 2, decision path 3 does *not* have an immediate outcome for this first set of judgments of staying or leaving. Instead, in the first set of judgments the immediate outcome for a fit decision is to stay; for a no-fit decision in decision path 3, the immediate outcome is some level of disaffection. This disaffection prompts the employee to begin examining job alternatives. In the second set of judgments, she or he assesses the three images and the possible alternatives for compatibility (or fit). Here, a judgment of no-fit leads to the deletion of a located alternative from further consideration; in contrast, a judgment of fit leads to a decision to subject the fitting alternative to further scrutiny. In the third and final set of judgments, the surviving alternatives are subjected to an intendedly rational analysis (e.g., a SEU model). The employee selects the option that is judged to maximize his or

her preferences from the set of surviving alternatives. Thus, the outcome of these three sets of decisions is to stay if the current organization is judged best or to leave if another organization is judged better. The essential features of decision path 3 are the presence of a shock, image violations, some disaffection, job search, evaluation of alternatives, and offers in hand. For example, a woman is transferred to another location (a shock) and becomes unhappy (misfit between shock and images). As a result, she begins to read employment advertisements and to signal colleagues that she might want to leave. When alternatives are located, they are again judged with respect to the three images. If the surviving alternatives are judged acceptable but no better than the current situation, the employee stays. If one alternative is judged acceptable and better than the present situation, she leaves.

Decision path 4. Here, no shock is involved. Organizational life is characterized as ongoing, with few distinguishing events. Over time, some employees may come to believe that they no longer fit in their jobs, because their values have become compromised or their goals are not being reached. It is important to note that without a shock, this evaluation occurs gradually. A judgment of fit suggests job satisfaction; a judgment of no-fit suggests some job dissatisfaction. At this point, decision path 4 separates into two subpaths. In path 4a, some people experience so much job dissatisfaction that they simply quit, regardless of the presence or absence of alternatives. Its essential characteristics include image violation and disaffection. In path 4b, people engage in the better specified quitting processes described by the traditional turnover models. Thus, decision path 4b is theorized to begin with some level of job dissatisfaction. In sequence, dissatisfaction leads to lower organizational commitment, job search activity, perception of the feasibility of mobility, an intention to leave, and a higher likelihood of quitting. Its essential characteristics include image violation, some disaffection, job search, evaluation of alternatives, and offers in hand.

Hypotheses

Recall that decision paths can be categorized by whether shocks occur and the nature of the mental deliberations involved with quitting. Table 1 lists the essential features of each decision path. In addition to specifying the presence of essential features, Table 1 identifies the absence of characteristics for a given decision path. Each of the following hypotheses corresponds to a decision path.

Hypothesis 1: In decision path 1, a shock and matching script occur, but job search, evaluation of alternatives, and offers in hand do not.

Hypothesis 2: In decision path 2, a shock and at least one image violation occur, but a matching script, job search, evaluation of alternatives, and offers in hand do not.

Hypothesis 3: In decision path 3, a shock, at least one image violation, some disaffection, a job search, an evalua-

TABLE 1
Decision Path Prototypes for Leavers^a

Decision Path	Shock	Matching Script	Image Violation	Disaffection	Job Search	Evaluation of Alternatives	Offers in Hand
1	Yes	Yes	n.a.	n.a.	No	No	No
2	Yes	No	Yes	n.a.	No	No	No
3	Yes	No	Yes	Yes	Yes ^b	Yes	Yes
4a	No	No	Yes	Yes	No ^c	No	No
4b	No	No	Yes	Yes	Yes	Yes	Yes

^a The code "n.a." indicates the characteristic is not applicable to the decision path and may or may not occur.

^b If the shock is an unsolicited job offer or feeler, job search does not technically occur.

^c No job search occurs *before* quitting; a job search may occur *after* quitting.

tion of alternatives, and at least one job offer in hand occur, but a matching script does not.

Hypothesis 4a: In decision path 4a, at least one image violation and some disaffection occur, but a shock, a matching script, a job search, an evaluation of alternatives, and offers in hand do not.

Hypothesis 4b: In decision path 4b, at least one image violation, some disaffection, a job search, an evaluation of alternatives, and at least one job offer in hand occur, but a shock and a matching script do not.

In addition, the unfolding model implies, but does not specify, that the time required for an individual to follow each decision path varies. For example, the time required for decision path 1 should be less than that for decision path 4. Lee and Mitchell (1994) also suggested that the shocks associated with decision paths 1, 2, and 3 seem likely to vary by whether they (1) were expected or unexpected, (2) were positive or negative, or (3) originated from nonwork, immediate job, or organizational sources. For example, shocks that initiate decision path 2 are likely to be unexpected and negative; shocks that initiate decision path 3 can be unexpected but either positive or negative; and shocks that initiate decision path 1 can be expected or unexpected and positive or negative. Finally, although the unfolding model does not specify whether particular image violations were associated with particular paths, it does suggest that decision paths 2–4 will include image violations. Thus, the following more general hypotheses are offered:

Hypothesis 5: The decision paths will vary in their speed of occurrence.

Hypothesis 6: Decision paths 1, 2, and 3 will be associated with (1) expected or unexpected shocks, (2) positive, neutral, or negative shocks, and (3) nonwork, immediate job, or larger organizational shocks.

Hypothesis 7: Decision paths 2-4 will be associated with image violations.

METHODS

Design

A multiple case study design was adopted (Yin, 1994). Although some applications of this design have been used to generate theoretical propositions (e.g., Eisenhardt, 1989; Eisenhardt & Bourgeois, 1988; Yan & Gray, 1994), our application was to test theory-based hypotheses. Yin (1994) described the multiple case design as more analogous to a series of experiments than to correlational field studies; that is, the primary interest of a researcher employing the design is to test theoretical propositions, with only a secondary concern for generalizing to a larger or an alternative population. Because the unfolding model is relatively new to the literature and because it is complex, deducing and testing the essential features of the decision paths, in the form of theory-based hypotheses, is an appropriate and necessary initial test. It is important to note that our theory and, therefore, this study do not focus on comparing stayers with leavers. Instead, our focus is on different forms of quitting.

Participants. Forty-four nurses who had voluntarily quit their nursing jobs at hospitals participated in semistructured, in-depth interviews. Their mean age was 37 years (s.d. = 11 years), and all but one were women. Because nurses commonly change their work status from full- to part-time and then back again while working for the same hospital, we report tenure based on both statuses. Thus, the nurses' average tenure as full-time employees was 45 months (s.d. = 46 months), and their average tenure as part-time employees was 30 months (s.d. = 21 months). The participants' mean year of graduation from nursing school was 1987 (s.d. = 7 years). They averaged less than one dependent (s.d. = 1), and their average percentage contribution to family income was 72 percent (s.d. = 29%).

Research protocol. Following Yin's (1994) recommendations, we developed the study's protocol using an iterative process involving the four authors. First, the senior author drafted an initial version of the study's overview statement, field procedures, schedule of interview questions, standardized document for field notes, and follow-up mail survey and provided these to the co-authors. The latter separately recommended improvements to the initial draft. Three additional cycles of revision were required before the final protocol document was agreed upon by all authors.

Data Collection

Contact. The administrators of five West Coast hospitals agreed to provide each departing nurse with a letter describing the research and inviting her or his participation in the study as well as a stamped postcard addressed to the researchers and indicating the individual's willingness to participate. Approximately 40 percent of all leavers agreed to participate. Upon receiving a postcard, we arranged an interview with each leaver.

Follow-up survey. All interviewees agreed to respond to a follow-up questionnaire that was mailed immediately after the interview, along with a self-addressed, stamped envelope. As is described below, the purpose of the survey data gathered through this questionnaire was to assess the reliability and validity of scores we derived from the interviews. A total of 34 (77%) questionnaires were returned. Unfortunately, seven surveys could not be linked to specific interviews; for instance, some respondents provided only their first names, which resulted in questionnaires with duplicate first names. In sum, 27 (61%) usable questionnaires were obtained.

Questions. The Appendix lists the questions asked of each nurse during the semistructured interview. These questions were designed to assess the major components of the unfolding model. For example, questions 1 and 2 address shocks; questions 4 and 8 ask about the time to decide; 5, 6, and 7 are about the search for job alternatives; 9 through 13 deal with fit judgments; and question 14 concerns scripts. The Appendix also lists additional questions that the first and second authors answered after reviewing all interview materials and their response options (discussed below). Table 2 lists the ten items from the mailed survey, ten interview items that match the survey items, and their correlations.

Interviews. We asked each participant for permission to tape-record the interview. Forty nurses agreed, and their interviews were recorded. These interviews were 20 to 40 minutes long. Four individuals declined to be recorded; as a result, the interviewer for these four interviews kept extensive, virtually verbatim, notes. These interviews required about 30 minutes each. Of the taped interviews, 31 were transcribed, and subsequent scoring was based on both the tape recordings and transcriptions. For 9 interviews, scoring was based on the original tape recordings only; for 4 other interviews, scoring was based on field notes only. All interviews were conducted by either the third or fourth author and occurred from September 1992 through January 1994.

Scoring

Independent judgments. The first and second authors, who did not interview nurses, independently listened to all tape-recorded interviews and read all transcribed interviews and notes. Also separately, these authors categorized each interviewee's response to each question. In most cases, we used a binary yes or no categorization in order to simplify the interpretation of the qualitative interview data and the statistical analysis; exceptions are noted in the Appendix.

Joint judgments. After all materials were reviewed and the independent judgments made, the two evaluating authors verbally summarized to one another the written and tape-recorded answers to the interview and categorizing questions. There was some disagreement on approximately 10 percent of the items, but these disagreements were resolved via further discussion. When necessary, original source materials were revisited.

TABLE 2
Interview and Survey Items^a

Item Number	Interview	Survey	<i>r</i>	<i>p</i>
1	Was there a clearly distinguishable and jarring event?	There was a particularly identifiable event that started me thinking about leaving.	.43	.02
2	Did you consider other job alternatives or options in making your decision?	I considered other job options when deciding to leave.	.63	<.001
3	Was the job search comprehensive? That is, how thoroughly did you gather information on other job options?	I gathered lots of information about other job options.	.69	<.001
4	Did you already have some job offers when you decided to quit?	I had actual job offers in hand before I decided to leave.	.67	<.001
5	How would you rate the compatibility between your personal goals and values (which can include professional) and those of your hospital?	My values match up well with the organizational values of the hospital I left.	.64	<.001 (<i>n</i> = 27)
6	Was your career progressing the way you expected it to?	My professional goals were being met in the hospital I left.	.48	.005 (<i>n</i> = 27)
7	Have you ever been in a similar set of circumstances before (in terms of leaving a job)?	I've left hospitals before for similar reasons.	.24	.13
8	Were these deliberations quick?	I deliberated a long time before I decided to leave.	-.31	.07
9	Is there anything that your peers, supervisor, or the hospital could have done before you actually quit which might have caused you to stay?	If the hospital had done a couple of things for me, I would have stayed.	.21	.12
10	What's your current job?	I am currently working as a nurse.	.57	.008

^a Questions 5 and 6 involve continuous variables, and product moment correlations are reported. The other questions involve a dichotomous and continuous variable, and point biserial correlations are reported.

Additional judgments. To help minimize bias and to continue triangulation around constructs, a post-baccalaureate colleague who had no prior connection with the current study, the researchers, or the unfolding model was recruited to replicate the scoring authors' judgmental process. We explicitly instructed this judge to be skeptical, to question broadly, and to identify inconsistencies. She first reviewed all published documents on the unfolding model and clarified any ambiguities verbally with the first two authors. Second, she listened to all tape-recorded interviews and read all transcribed documents. Third, she rendered a set of independent judgments and also reached joint judgments with the senior author. Although substantial agreement with prior judgments emerged, this individual identified three answers that required changes in the judgments made by the first two authors. From these joint discussions, final interview scores were derived.

Survey. Respondents answered each survey question on five-point Likert scales (1, strongly disagree, to 5, strongly agree). Additional analyses were conducted to detect differences between survey respondents and nonrespondents. First, we conducted *t*-tests on the demographic variables of age, full-time tenure, part-time tenure, years since graduation, number of dependents, and percentage of family income provided by the nurse's job. No significant differences were found. Second, nonparametric tests were conducted on the categorical judgments listed in Table 2, which shows the matched items from the interviews (categorical variables) and survey (continuous variables). No significant differences were found between respondents and nonrespondents for separate distributions, separate populations, differences in ranks, and differences in medians. Although conducted on small samples, these tests indicate no pattern of differences between the respondents and nonrespondents.

Analysis

To assess the reliability and validity of the interview scores, we calculated correlations. For Hypotheses 1–4b, Yin's (1994: 106–109) pattern-matching technique was applied. With pattern matching, successful "literal replications" are achieved when the theorized essential features for a given decision path are judged to occur across multiple cases. Successful "theoretical replications" are achieved when the pattern of essential features results in the unique classification of cases (e.g., a case follows one and only one decision path). For Hypothesis 5, we conducted an analysis of medians. For Hypotheses 6 and 7, we calculated hierarchical log linear models identifying significant associations that were described via contingency tables.

RESULTS

Reliability and Validity

At least some interrater reliability for the interview scores can be inferred from the high initial agreement and 100 percent final agreement among

the three scorers. Additional evidence for reliability can be found in the correlations between matched items from the interview and subsequent mailed survey reported in Table 2. Eight of the ten correlations are statistically significant, and all are in the expected direction. Their average absolute value is .49 (s.d. = .17), with a range from .21 to .69. It is important to note that to the extent our two measurements—the interview responses scored by authors and the survey items self-reported by the nurses—are seen as different methods, the above data can also be interpreted as evidence for convergent validity.

In addition, the nurses' self-reported survey responses assessing components of the decision paths were correlated with the summary path judgments made by the authors based on the interview data. Although imperfect, a pattern of statistically significant correlations (reported in Table 3) depicts characteristics consistent with the unfolding model's theorized decision paths. For example, the occurrence of decision path 1 was positively correlated with a shock and the attainment of professional goals but negatively correlated with consideration of other job options, gathering of information about other job options, having job offers in hand when the quitting event occurred, and the "avoidability" of the event; the occurrence of decision path 2 was positively related with a shock but negatively related with the fit between a nurse's and hospital's values and the length of time required for deliberations. It should be noted that these significant correlations (as well as those in Table 2) were based on a small sample ($N = 27$), indicating corroboration in the presence of minimal statistical power. When considered together, the evidence for reliability and the pattern of significant correlations in Table 3 suggest the interview scores have sufficient construct validity (Nunnally, 1978: 94–104) to serve as a basis for addressing the study's hypotheses.

Illustrative Cases

Overall, 6 nurses (14%) were judged to follow decision path 1; 6 nurses (14%) were judged to follow decision path 2; 14 nurses (32%) were judged to follow decision path 3; 8 (18%) were judged to follow path 4a, and 10 (23%) were judged to follow path 4b. To convey a sense of the interview data and pattern-matching technique, we offer the following edited excerpts from our cases. In decision path 1, the essential features are the presence of a shock and matching script and the absence of search, evaluations, and offers. Case 4 had these features:

My husband just retired last week [the shock]. . . . and we're going to travel for a year, so it [the entire issue of quitting] took care of itself [the script].

Moreover, this nurse reported that she did no job search, did not evaluate alternatives, and had no offers in hand. For her, quitting was part of a pre-existing plan for future action.

In decision path 2, the essential features are the presence of a shock and at least one image violation; a script, a search for alternatives, and offers are absent. Case 22 is illustrative:

TABLE 3
Point Biserial Correlations^a

Decision Paths	Survey Items ^b									
	1	2	3	4	5	6	7	8	9	10
1	.39***	-.60***	-.47***	-.43***	.12	.39*	-.29	-.19	-.50***	-.11
2	.28*	.09	-.02	-.08	-.52**	-.04	-.09	-.39***	.27	-.20
3	.10	.13	-.01	.47**	-.02	-.13	.20	.10	.10	.31*
4a	-.39*	-.06	.02	-.53***	.35*	.17	-.26*	.08	-.09	-.27†
4b	-.25	.34**	.40***	.43***	-.08	-.34†	.31†	.28	.18	.14

^a $N = 27$.

^b The texts of the survey questions appear in Table 2.

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

There was some talk regarding telemetry services to my unit. It was "Here is a telemetry class. You can take it if you want to." Over a period of about nine months, the focus changed from "You can take it and get certified" to "You have to take it, and if you do not pass the course by a certain day, you cannot work on the floor" [the shock]. And so, cardiac has not been an interest of mine [image violation], and . . . when . . . those services came [I quit].

When asked whether a particular event caused her to think about quitting, the nurse in case 22 replied, "When that edict came down." No serious previous thoughts about quitting were detected. Moreover, no script, search, or offers in hand could be detected. Thus, it appears she was sufficiently offended by the new requirement that she quit immediately.

In decision path 3, the essential features are the presence of a shock, at least one image violation, some disaffection, a job search, an evaluation of alternatives, and at least one offer in hand; a script is absent. In case 2, these features were observed as follows:

The first thing that caused me to think about leaving was that physician offering me that position [in his private clinic], giving me another option [the shock and offer in hand]. I had been frustrated for awhile [the disaffection], but I hadn't even considered leaving until somebody offered me a better position [a limited job search]. . . . I investigated the job that I took in the clinic very thoroughly [the evaluation].

Additionally, no evidence for a matching script was found. Thus, a particular event precipitated her mental comparison between her current job and an offer in hand.

In decision path 4a, the presence of at least one image violation and some disaffection and the absence of a shock, script, search, evaluations, and offers are the essential features. These features were described by the nurse in case 10:

I started to get bored with my job [the disaffection]. I started to feel like it was the same every day. . . . Every weekend I had to go in [the image violation]. I regretted having to go to work. . . . I don't think that there was one event [that caused these feelings]. . . . I quit before I had another job.

In decision path 4b, the presence of at least one image violation, some disaffection, a job search, an evaluation of alternatives, and at least one offer in hand, and the absence of a shock and script are the essential features. These features were described in case 3:

It was kind of an accumulation of things; mostly, I think frustration [the disaffection]. I worked there in my current position essentially for almost six years. I was working night shifts . . . which was not my first choice [the image violation]. . . . The frustration had been increasing over the last year and a half, but I really didn't think about leaving. Then, I toyed with the idea of leaving, maybe a month . . . I finally decided to pursue an interview. [Did you search for other jobs before or after you left the hospital?] Before. [Did you accept a job before you quit?] Yes.

Decision Path Hypotheses

Hypothesis 1 predicts that, for a subset of cases, a shock and matching script occur, but job search, evaluation of alternatives, and offers in hand do not. Table 4 summarizes six cases that were judged to show decision path 1 characteristics. In three cases (12, 20, and 31), the shock involved a decision to relocate (e.g., the husband's decision to move in order to find another job in case 20), and the matching script was the nurse's quitting in order to relocate (e.g., the wife followed the husband in case 20). In three other cases (4, 17, and 18), the shock and script involved lifestyle changes. In case 4, for example, the husband's retirement signaled the onset of a new lifestyle, in which the couple would vacation for a year before deciding on what to do next; the nurse's quitting was a necessary precondition for the vacation. In case 17, a pregnancy signaled the onset of a new lifestyle, in which the wife would become a stay-at-home mother for the next several years; quitting was a necessary step toward the new homemaker's role. In case 18, acceptance into graduate school signaled the onset of the next career stage, earning a master's degree in nursing; quitting was a necessary step toward matriculation.

In all six cases, voluntary quitting was not the most salient feature of the interview responses; that is, it did not stand out as the focal event. Instead, quitting was embedded within a larger set of ongoing events, decisions, and processes; its occurrence was simply necessary to accomplish some

TABLE 4
Cross-Case Replications of Decision Path 1^a

Case	Shock	Matching Script
4	Her husband retired.	"We're going to travel for a year, so it [the entire issue of quitting] took care of itself."
12	She relocated to another state.	"I left because I was moving to another state. . . . So, the actual reason I ended up leaving was because I was no longer there locally."
17	She became pregnant with her third child.	"The reason that I did stop working . . . is to have more time with my family. That is the only reason. . . . I am expecting my third child."
18	She was accepted into graduate school.	"It was very simple; I am going to graduate school. . . . It had nothing to do with my job. It had everything to do with my personal situation. . . . Very quickly, as soon as I got the letter that I was accepted into graduate school, the decision was made."
20	Her husband decided to relocate.	"Last summer, we moved. My husband was thinking about getting a job elsewhere."
31	Her husband accepted a job in another city.	"The reason I left didn't have anything to do with the hospital. It was because we moved. . . . If my husband hadn't accepted a position [in a new location], I would have stayed."

^a For these six cases, a shock and matching script were judged to occur, but job search, evaluation of alternatives, and offers in hand were judged *not* to have occurred. Thus, these six cases provide evidence for decision path 1.

presumably more important goal, such as following one's husband, raising a preschool child, or traveling. Inconsistent with most traditional turnover theories that hold quitting to be the focal and distinctive outcome event, these six cases depict quitting as secondary in importance and simply another step toward a more salient outcome.

A further contrast to most traditional turnover models was the finding that job dissatisfaction seemed irrelevant to the quitting process in these six cases. For example, the nurses in cases 20 and 31 explicitly stated that they were satisfied with their jobs and organizationally committed when they quit, and the nurses in cases 4, 12, 17, and 18 stated that their feelings about the job were irrelevant to their quitting. Additionally, no particular positive or negative pattern could be detected in the shocks in these six cases. For instance, whereas the husband's retirement in case 4 and the interviewee's acceptance into graduate school in case 18 seem positive, relocation in cases 12, 20, and 31 and becoming pregnant in case 17 can be taken as negative or positive. Finally, five of the six cases involved expected shocks. For example, retirement, relocation, and acceptance into graduate school were probably not surprises, whereas becoming pregnant could be expected or unexpected. In sum, six cases were identified as clearly demonstrating decision path 1 features.

Hypothesis 2 predicts that, in a subset of cases, a shock and at least one image violation occur, but a matching script, job search, evaluation of alternatives, and offers in hand do not. Table 5 summarizes six cases that were judged to show decision path 2 characteristics. In all six cases, the shock was negative; for instance, the shock in case 42 was a negative performance evaluation. In all six cases, at least one image violation occurred. In five cases (19, 22, 34, 42, and 44), the value image was violated (for instance, the nurse in case 19 wanted to be in a teaching hospital instead of a general care facility). In four cases (19, 22, 34, and 42), the trajectory image was violated (for instance, the nurse in case 19 felt unable to attain floor experience). In five cases (9, 19, 22, 34, and 42), the strategic image was violated (for instance, in the long run, the nurse in case 19 thought transferring to a preferred floor was unlikely).

In three of these cases, events or circumstances were reported that may not be entirely consistent with decision path 2 of the unfolding model, as evaluation of alternatives and having offers in hand may have occurred. In case 19, the nurse believed very strongly that returning to a former job would be quite easy. Although she did not actively pursue her former job, the perceived option did affect her subsequent mental deliberations. Thus, she did not search for another job but did evaluate an alternative, albeit a perceived one rather than an actual offer in hand. In case 9, the nurse's family owned a small certified accounting business that provided a permanent job offer. Thus, she did not search for another job and evaluated no new alternatives but had a fallback. In case 34, the nurse worked a second part-time nursing job while fully employed at the hospital. Thus, she did not search for another job or evaluate new alternatives, believing her part-time position

TABLE 5
Cross-Case Replications of Decision Path 2^a

Case	Shock	Image Violations
9 ^b	She was forced into a life-threatening emergency surgery for which she was unprepared.	Strategic: In the long run, her personal and career goals were not likely to be achieved via nursing.
19	Her husband was unable to transfer to her current location.	Value: She wanted to work in a teaching-community hospital, instead of her current general hospital. Trajectory: She wanted floor experience but was not getting it. Strategic: Subsequent transfer to a floor was unlikely.
22	A previously optional telemetry class became a necessary requirement to keep her job.	Value: "On a scale of 1 to 10, a 5." Trajectory: She didn't want to work in cardiac. Strategic: Her career goals were not progressing well.
34 ^c	She was denied a six-month leave of absence.	Value: "No fit at all between my . . . values and those of the hospital." Trajectory: Her current goals were not progressing as expected. Strategic: Her career goals weren't likely to be met over time.
42	She received a negative and unexpected performance evaluation while on maternity leave.	Value, trajectory, and strategic: She believed that the director of nursing had decided to force her to resign.
44	Her hospital ordered a shift from individual to team-based nursing.	Value: She wasn't comfortable working for a large bureaucratic organization.

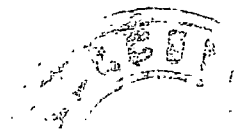
^a For these six cases, a shock and at least one image violation were judged to have occurred, but a matching script, job search, evaluation of alternatives, and offers in hand were judged *not* to have occurred. Thus, these six cases provide evidence for decision path 2.

^b This nurse's family owned an accounting business that provided an ongoing and permanent job alternative. After the shock, she left nursing and ultimately became a certified public accountant.

^c The nurse was working a second, part-time job when she quit her primary, full-time position. She considered her second job an "offer in hand."

to be an opportunity to work when she abruptly quit her full-time job. These three cases suggest that the unfolding model may not explain the effects of potential buffers to the disruption of quitting. Part-time jobs, family businesses, and strong beliefs about the availability of alternatives may negate the negative side of quitting. Finally, no particular pattern could be detected among these six cases about whether the shocks were expected or unexpected. In sum, six cases were identified as demonstrating decision path 2 features. Three cases, however, contained unexpected and unusual circumstances that may be inconsistent with the unfolding model.

Hypothesis 3 predicts that, for a subset of cases, a shock, at least one image violation, some disaffection, a job search, an evaluation of alternatives,



and at least one job offer in hand occur, but a matching script does not. Fourteen cases were judged to show decision path 3 characteristics. In particular, 8 cases possessed all theorized features for decision path 3. All 14 cases had image violations as predicted. However, contrary to Hypothesis 3, six cases contained one or more theoretical misspecification: (1) case 6 had a matching script, (2) cases 21, 25, and 26 had no offer in hand but evaluated anticipated alternatives, (3) case 1 had a matching script, no evaluation of alternatives, and no offers in hand but did contain an active job search; and (4) case 7 did not contain evaluation of alternatives or offers in hand but did contain an active job search. To conserve space, Table 6 summarizes cases 2 and 8 as confirming examples and cases 1 and 7 as disconfirming incidents.

The disconfirming cases suggest two potential problems with the current description of decision path 3. First, the explicit specification in the unfolding model that evaluations must be of actual job offers in hand may need to be relaxed. The nurses in cases 21, 25, and 26 evaluated anticipated alternatives, and the nurses in cases 21 and 25 perceived these options to be very likely. Second, the unfolding model may need to address switching between paths more directly. In case 7, path 3 appears to have been initially followed, but the inability to find an alternative job, coupled with a powerful shock (a co-worker's suicide) and strong disaffection (management's handling of the suicide), seemed to have produced a switch to decision path 2. At some point, the nurse appears to have decided that "enough was enough" and immediately quit. Additionally, no patterns of expected or unexpected and positive, neutral, or negative shocks could be observed. No particular pattern of image violations could be detected either. In sum, 14 cases were identified as demonstrating decision path 3 features, but 6 contained one or more theoretical misspecification.

Hypothesis 4a predicts that, for a subset of cases, at least one image violation and some disaffection occur, but a shock, a matching script, a job search, an evaluation of alternatives, and offers do not. Eight cases were judged to contain decision path 4a characteristics, of which seven possessed all theorized features. All eight cases had image violations as predicted. However, contrary to the hypothesis, one case demonstrated two theoretical misspecifications: case 29 had a matching script and reported no disaffection. The nurse in this case did not have and evaluate a job alternative but did have and evaluate an offer of admission to a master's program in nursing. Hypothetically, case 29 might merit reclassification to path 4b, if the unfolding model had allowed the graduate school option to be equivalent to a job alternative. Thus, the roles of matching scripts, disaffection, and job alternatives in decision path 4a may need to be reconsidered in the unfolding model. To conserve space, Table 7 summarizes cases 10 and 28 as confirming examples and case 29 as a sole disconfirming incident.

Hypothesis 4b predicts that, for a subset of cases, at least one image violation, some disaffection, a job search, an evaluation of alternatives, and at least one offer in hand occur, but a shock and a matching script do not. Ten cases were judged to contain decision path 4b characteristics, of which

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six possessed all theorized features. All ten cases had image violations. Four cases contained one or more theoretical misspecification: (1) the nurses in cases 15 and 43 reported minimal disaffection with their jobs, and (2) those in cases 13 and 36 enacted matching scripts but had no job offers in hand when they quit, though both strongly believed alternatives were very likely. Thus, the roles of matching scripts, disaffection, and explicit offers in hand in decision path 4b may need to be reconsidered in the unfolding model. To conserve space, Table 8 summarizes cases 3 and 5 as confirming examples and cases 13 and 36 as disconfirming incidents.

Cross-Case Analyses

Hypothesis 5 predicts that the speed of decision paths will vary. Speed was assessed by the number of weeks that the nurses reported as elapsing between their first thinking of quitting and the final decision to quit. Because nonnormality appeared likely, we tested the assumption of normality for speed of decision paths with Kolmogorov-Smirnov's goodness-of-fit statistics (K-S) and rejected it ($K-S = 1.85, p = .002$). Thus, we used analyses of medians to compare the speed of each decision path with that of each other decision path. It was found that decision path 1 was marginally quicker than 4a ($p < .08$) and significantly quicker than 4b ($p = .05$). Decision path 2 was marginally quicker than decision path 4a ($p < .08$). Thus, the speed of decision paths seems to vary as implied by the model.

Hypothesis 6 predicts differential associations between decision paths and types of shocks. Hierarchical log linear analysis indicated no meaningful three-way or higher associations among (1) decision paths (items 14–18 in the second part of the Appendix, where all other items noted here also appear), (2) expected versus unexpected shocks (item 2), (3) positive, neutral, or negative shocks (item 3), and (4) nonwork, immediate job, or organizational shocks (items 4–6). However, certain two-way associations were identified as statistically significant and meaningful. To clarify these significant associations, we constructed the corresponding two-by-two contingency tables. First, unexpected (coded 0) or expected (coded 1) shocks were crossed with the absence (0) or presence (1) of decision path 1. It was found that the onset of an expected shock was positively associated with the likelihood of decision path 1 ($\chi^2 = 7.00, p = .006, r = .58$). Second, the absence (0) or presence (1) of nonwork shocks was crossed with the absence (0) or presence (1) of decision path 1 and with the absence (0) or presence (1) of decision path 2. It was found that the onset of nonwork shocks was positively associated with the likelihood of decision path 1 ($\chi^2 = 11.84, p < .001, r = .68$) but negatively, though marginally, associated with decision path 2 ($\chi^2 = 2.68, p = .10, r = -.33$). Third, the absence (0) or presence (1) of immediate job shocks was crossed with the absence (0) or presence (1) of decision path 1 and with the absence (0) or presence (1) of decision path 3 as well. It was found that the onset of immediate job shocks was negatively associated with the likelihood of decision path 1 ($\chi^2 = 5.34, p = .02, r = -.47$) but positively associated with the onset of decision path 3 ($\chi^2 = 4.20, p = .04, r = .42$).

p 10, 123

TABLE 6
Cross-Case Replications of Decision Path 3^a

Case	Shock	Image Violations					Job Search	Misspecification ^b
		Value	Trajectory	Strategic	Evaluation	Disaffection		
2	"The first thing that caused me to think about leaving was that physician offering me that position, giving me another option. I had been frustrated for a while, but hadn't even considered leaving until somebody offered me a better position."	"A lot of it [the job] began to be trivialized . . . I didn't have time to do the things that were important to me."	"I expected that I would stay . . . a hospital nurse [but the job changed]."	"I would not be able to accomplish [her goals] at the hospital."	She evaluated "only the clinic that I was offered [a job] by the physician."			
8	Completion of a master's degree in nursing.		The cost of living and urban lifestyle did not fit her ideas about raising a family.		She pursued jobs in research, insurance companies, teaching, rehabilitation centers, and hospitals.	She wanted a different lifestyle than what her current job and the local community offered.		

TABLE 6 (continued)

Case	Image Violations					Mispecification ^b
	Shock	Value	Trajectory	Strategic	Evaluation	
1	Her husband accepted a job in another city.	"I was morally opposed to some of the decisions that were made."	Her personal goals were not being fulfilled.	Her personal goals were not likely to become fulfilled over time.	The image violation produced a modest amount of disaffection, but the disaffection, by itself, would not have prompted the quit.	1: A possible matching script existed. Years earlier, her husband had relocated to attend graduate school; correspondingly, she also quit a prior job and relocated with her husband. 2 & 3: She had no offers in hand when she quit, and therefore she evaluated no alternatives.
7	A secretary in her ward committed suicide.	She no longer felt that patients were in a healthy environment.	She wanted to learn different areas of nursing, but the opportunities weren't likely to occur in the foreseeable future. ^c		She was very unhappy with the hospital's handling of the suicide event. Ultimately, counselors were provided for the nurses.	1 & 2: No offers were in hand when she quit. Therefore no alternatives were evaluated. She extensively searched newspaper ads, employment offices, personal contacts, and blanket sending of resumes.

^a Cases 2, 8, 11, 23, 27, 30, 32, and 37 were judged to demonstrate a shock, at least one image violation, some disaffection, a job search, an evaluation of alternatives, and at least one job offer in hand, and a matching script was judged not to occur. To conserve space, we summarize only two examples here.

^b Case 1, 6, 7, 21, 25, and 26 were judged to show one or more theoretical misspecification. To conserve space, the two most disconfirming cases are summarized here.

^c This is both a trajectory and a strategic image violation.

TABLE 7
Cross-Case Replications of Decision Path 4a^a

Case	Image Violations			Misspecification
	Value	Strategic	Disaffection	
10 ^b		It would have taken too long and required too many unpleasant sacrifices to obtain her goals.	"I started to get bored with my job . . . Every other weekend, I had to go in . . . I regretted having to go to work."	
28 ^b	She had difficulty making friends and adjusting to living in the city. She also disagreed with hospital's patient care policies and practices.	She saw little likelihood for personal and professional goal attainment now or into the foreseeable future. ^c	She disliked her job, having few [if any friends], the coldness of the city's residents, and the city's weather.	

TABLE 7 (continued)

Case	Image Violations		Disaffection	Misspecification
	Value	Strategic		
29		In the long run, she wanted to earn a graduate nursing degree, which could only be done via quitting and returning to school full time.		1: A possible script existed. Years earlier, she had quit a job to return to school full time in order to earn a bachelor's degree in nursing. 2: No disaffection occurred. 3: She evaluated the issue of whether to quit now or later in order to return to school; admission to graduate school was only a <i>minor</i> concern. 4: No job offers were in hand when she quit, but the admission's offer could be considered an "offer."

^a Cases 10, 14, 28, 33, 35, 40, and 41 were judged to demonstrate at least one image violation and some disaffection; a shock, matching script, job search, evaluation of alternatives, and offers in hand were judged *not* to occur. To save space, only two examples are summarized here. Only case 29 was judged to show one or more theoretical misspecification.

^b The case 10 nurse searched for a job only after quitting. The case 28 nurse searched after relocation to New Mexico.

^c This is a strategic and trajectory violation.

TABLE 8
Cross-Case Replications of Decision Path 4b^{a,b}

Case	Image Violations					Job Search	Misspecification
	Value	Strategic	Trajectory	Evaluation	Disaffection		
3	"With cost cutting and the overall scare in health care these days, some of us didn't feel they were maintaining the same commitment to staff . . . [employees] did not feel a true part of the organization anymore."	Her career goals were not likely to be fulfilled in the long run.	Her career goals were not being met.	She evaluated multiple job offers.	She felt frustration with relations among personnel, a lack of respect by the charge nurse, and the cost cutting.		
5		These problems were going to continue and patient care was going to suffer further.	She had problems with her work schedule and the "deluge of . . . surveys, [research] studies, opinion polls, questionnaires, tests and meetings . . . [that] took away from patient care."	She carefully evaluated offers before quitting.	She felt frustration with her work schedule and ongoing disruptions to patient care.		

TABLE 8 (continued)

Case	Image Violations				Job Search	Misspecification
	Value	Strategic	Trajectory	Evaluation		
13	The hospital changed the kind of nursing required and her working conditions.	The changes in the job itself and working conditions were relatively permanent. ^c			She conducted a very comprehensive job search.	1: A possible matching script existed. For a previous job, she had been hired to perform one kind of nursing but required to perform another; she quit that prior job. 2: Although she believed a job offer was very likely, a job offer was not in hand when she quit.
36 ^d	She perceived no agreement on values between herself and the hospital.	Her personal and career goals were floundering, and improvement seemed unlikely over time. ^e			Virtually every aspect of her personal and professional life caused dissatisfaction.	1: A matching script existed. She had often quit prior jobs when she perceived mismatching values. 2 & 3: Although she carefully searched before quitting, she found no alternatives. Thus, no evaluations occurred or offers in hand were present when she quit.

^a Cases 3, 5, 16, 24, 38, and 39 were judged to demonstrate at least one image violation, some dissatisfaction, a job search, an evaluation of alternatives, and at least one offer in hand; a shock and matching script were judged *not* to occur. To save space, only two examples are summarized here.

^b Cases 13, 15, 36, and 43 were judged to show one or more theoretical misspecification. To conserve space, the two *most* disconfirming cases are summarized here.

^c This is a strategic and trajectory violation.

^d This person had a life-long history of acute mental health problems. Separating her personal and career issues would require a qualified mental health professional.

Finally, the absence (0) or presence (1) of organizational shocks was crossed with the absence (0) or presence (1) of decision path 1 and with the absence (0) or presence (1) of decision path 2. It was found that the onset of organizational shocks was negatively, though marginally, associated with decision path 1 ($\chi^2 = 2.60$, $p = .10$, $r = -.33$) but positively associated with the onset of decision path 2 ($\chi^2 = 3.74$, $p = .05$, $r = .40$). Thus, the emergent story appears to be that decision path 1 most likely occurs with an expected and a nonwork shock, decision path 2 most likely occurs with an organizational and a negative shock, and decision path 3 most likely occurs with an immediate job shock.

Consistent with the prediction of Hypothesis 7, 100 percent of the nurses categorized as taking decision paths 2, 3, or 4 reported at least one image violation. It might be recalled that the unfolding model contains no prediction about image violations in decision path 1. However, there is no reason to assume that image violations could not be present in decision path 1. Interestingly, four of the six nurses categorized as taking decision path 1 indicated no image violation; the two other path 1 nurses did indicate image violations. Thus, image violations can occur in decision path 1 but appear to do so infrequently.

Additional analyses were conducted with the specific types of image violations (measured by items 19–21 in the second part of the Appendix). Hierarchical log linear analysis identified no meaningful three- or four-way association among a particular decision path and the three images. However, one two-way association was identified as potentially significant. To clarify this association, we crossed violation of the value image (0 = no, 1 = yes) with the absence (0) or presence (1) of decision path 2 in a two-by-two contingency table. It was found that the likelihood of decision path 2 was negatively, though marginally, associated with violations of the value image ($\chi^2 = 3.21$, $p = .07$, $r = -.27$). Thus, the particular image that was violated was only partially useful in classifying people into different paths.

DISCUSSION

The first empirical test of the unfolding model of voluntary employee turnover is reported. From interviews with people who had recently quit their jobs, reliable and valid indicators of the theory's decision paths were derived. As theoretically specified in Table 1, the essential features of each decision path were literally replicated across multiple cases and theoretically replicated via the unique classification of individuals to decision paths (Yin, 1994). In particular, the distinguishing characteristics of decision path 1 were quite salient (Table 4). Most typically, an expected and a non-work-related shock initiated a larger sequence of decisions, behaviors, and events, in which quitting was simply a quick part of the larger process. The features of decision path 2 were also quite distinguishable (Table 5). Typically, a negative organizational shock prompted a direct and relatively quick quitting event. Decision path 3 had its essential features replicated across a larger number of cases, but a smaller set provided potential disconfirmations. This

decision path was usually initiated by an immediate job shock (Table 6). Decision paths 4a and 4b were also replicated across a large set of cases, but a small number of cases provided some potential disconfirmations (Table 7-8). Across all cases, however, people appear to use different and distinct psychological processes when leaving organizations.

Ambiguities and Potential Improvements to the Unfolding Model

Catalytic scripts. The unfolding model specifies that matching scripts should not occur in decision paths 2, 3, and 4. Indeed, no matching scripts were judged to occur in our decision path 2 cases. However, matching scripts seemed evident in two cases from decision path 3 (1 and 6) and in three cases from decision path 4 (13, 29, and 36). Upon closer examination, these disconfirming cases could be separated into two distinct groups. The first group consists of cases 6, 13, 29, and 36. Although not directly affecting the behavior, the scripts did appear to facilitate the act of quitting; in other words, the scripts made subsequent mental deliberations and actual quitting easier. For example, the individual in case 6 (decision path 3) liked her hospital and was happy with the job but did not want to be a floating nurse (the disaffection). When she received an offer to be a nurse in a summer camp (a shock), she evaluated the opportunity and eventually accepted the job. During the prior summer, she had worked as a camp nurse. Her previous camp experience (the possible matching script) did not cause her to accept the offer automatically. Instead, it made the benefits and costs of repeating the experience quite clear. Thus, the role of scripts may not be limited to direct effects on quitting; there may be a catalytic function as well. As a clarification to the theory, scripts that directly affect quitting should be an essential feature of decision path 1. Scripts that facilitate, but are not direct effects on, quitting might be considered theoretically compatible with decision paths 3 and 4.

Direct effects of scripts in decision paths 3 and 4. The second group consists of case 1 (decision path 3; Table 6) only. Rather than having a catalytic role, the matching script appeared to affect the quitting behavior directly, though in conjunction with other direct effects. In case 1, the nurse's shock was her husband's decision to relocate to take another job. Previously, the nurse had quit a job and relocated when her husband entered graduate school; relocating again seemed a natural thing to do (the matching script). Additionally, the shock prompted evaluation of her images, whose violation led to some disaffection. The combination of the script, image violations, and disaffection led to a search for another job. Because there is only a single case, however, we offer no recommendation on the possible direct effects of scripts in decision paths 3 and 4.

Offers in hand and evaluation of alternatives. The unfolding model specifies that holding job offers in hand and evaluation of job alternatives do not occur in decision paths 1, 2, and 4a. Indeed, no offer in hand or evaluation of alternatives was judged to occur in the decision path 1 cases. However, some form of offers or evaluations seemed evident in three cases

from decision path 2 (9, 19, and 34) and in one case from decision path 4a (29; Table 7). As noted earlier, the nurse in case 9 had an ongoing option to enter her family's certified public accounting business; the one in case 19 evaluated the perceived option that she could easily return to a former job; the one in case 29 evaluated an acceptance to graduate school; and the case 34 nurse perceived her second part-time nursing job as an ongoing alternative. Additionally, the unfolding model specifies that holding offers and evaluating alternatives occur in decision paths 3 and 4b. Nurses in two cases from decision path 3 (21 and 25) and two cases from decision path 4b (13 and 36), however, actively searched for other jobs but quit before they obtained offers. Moreover, each of these four nurses believed that an actual job offer was highly likely. Two ambiguities about offers and evaluations appear to be suggested. First, how "real" must an offer (or alternative) be in order to undergo evaluation and to affect quitting? Must the offer be in writing, or can it be verbal but pending on higher approval, strongly implied, or vaguely inferred? In the cases cited above, the alternatives were actual or perceived as highly likely. We suggest as a point of departure for future research that an offer (or alternative) should be perceived as highly likely. Second, must the alternative be another job? Another suggested point of departure is that alternatives need not be limited to jobs; alternative *roles* may also be suitable (e.g., returning to school as in cases 18 and 29).

Switching paths. Nurses in two cases from decision path 3 (1 and 7; Table 6) reported experiencing shocks and image violations and engaging in extensive job searches. Before locating jobs, however, they abruptly quit. On the one hand, their quitting before finding alternative jobs constitutes a misspecification of decision path 3. On the other hand, their cases may signal switching between paths. As explained above, the nurse in case 1 quit when her husband relocated. The switch from decision path 3 to path 1 may have been made to avoid physical separation from her husband. As noted earlier, the shock in case 7 was a co-worker's suicide, and the image violations involved her management's response to the event. The switch from decision path 3 to path 2 may have occurred because the nurse in case 7 felt overwhelmed by the entire situation. The dynamics of path switching seems a worthwhile topic for future research.

Images. As the unfolding model predicts, the data indicated that image violations occur in all cases of decision paths 2, 3, and 4. Initially, however, we suspected that image violations did not occur in decision path 1, though the model does not offer a prediction. The data indicated that four of the six decision path 1 cases provided no evidence of image violations, but the other two cases did suggest image violations. It would appear that image violations can be associated with decision path 1 but perhaps do not play a causal role. These speculations may merit further research. In addition, certain predictions about images were not supported. For example, the unfolding model specifies that violations of value and trajectory images are involved with decision path 4, but violations of the strategic image are not (Lee &

Mitchell, 1994: 62). As in 17 of the 18 decision path 4 cases, violation of strategic image did occur, it appears that path does involve such violation.

Shocks. As predicted, all nurses in decision paths 1, 2, and 3 reported shocks, but no nurse in decision paths 4a or 4b reported a shock. However, cases 29 and 18 experienced the same event but reported it differently. The individual in case 29 (decision path 4a, Table 7) did not interpret an acceptance into a master's program in nursing as a shock. In contrast, the individual in case 18 (decision path 1, Table 4) *did* interpret an acceptance into a master's program in nursing as a shock, as well as her subsequent behavior set in motion by the acceptance. These contradicting reactions confused the three judges, who thought acceptance and matriculation into graduate school to be major life events. Upon examining the case 29 interview and discussing the issue with other nurses, the judges learned that pursuing advanced education in nursing is sometimes viewed as a matter of course, somewhat akin to public school teachers' pursuing a master's degree in education. Thus, the consensus among the judges (and outside nurses) was that no shock occurred in case 29, but a shock did occur in case 18. For one person, the event caused a pre-existing plan to be implemented, whereas for the other person, it led to extensive cognitive deliberation.

Potential Bias

Although the data are encouraging, three sources of potential bias merit brief comment. First, the study required interviewees to verbalize about their recent quitting experiences. As a result, memory biases were possible, including forgetting and retrospective rationality. Although potential memory effects cannot be completely eliminated, they might be somewhat discounted because the necessary recollections involved recent events. In addition, there is no reason to believe that any bias resulting from forgetting would be related to shocks, recollections about fit, the search for job alternatives, or the speed with which decisions were made. For example, there would be no reason to expect that a memory bias would result in more frequent occurrence of decision path 1 or less frequent occurrence of decision path 2.

Second, the authors of the unfolding model were among the researchers testing the theory. Given the subjective nature of interviews and scoring interview protocols, the potential for bias affecting judgments is substantial. Adding to our concern, some of the judgments were based on indirect inferences, such as the role of scripts in decision path 1. Although potential confirmatory biases cannot be completely eliminated, we took some precautions: (1) The people who conducted the interviews were separate from those who scored the interview responses. (2) We had a person who was not an author, associated with the authors, or previously aware of the unfolding model rate the interviews to check for interobserver agreement. (3) Judgments based on the interview data were checked against self-report survey data from the nurses. (4) Finally, we provide a large portion of the interview responses themselves in Tables 4–8 for independent inspection; creating and

presenting such a database constitutes one of Yin's (1994: 94) recommended principles of case study research.

Third, the data reported here involved nurses, who historically have had plentiful job opportunities. It may be that nurses implicitly assume that job alternatives are readily available and may, therefore, be overrepresented in decisions paths 1, 2, and 4a, where no job search is predicted. As a result, they may further assume that a job search can reasonably occur after quitting. Nonetheless, it should be noted the local job market for nurses weakened during the 18 months of data collection for the present study. Although possible effects from this potential bias cannot be completely eliminated, they might be somewhat lessened because of the slowdown in the local labor market for nurses.

IMPLICATIONS AND CONCLUSIONS

The unfolding model (Lee & Mitchell, 1994) suggests some new and different ways to conceptualize the turnover process. Although not all theory-based predictions were confirmed in the present study, some meaningful points should be highlighted. First, in 55 percent of the cases job dissatisfaction was reported, followed by a job search, an evaluation of located alternatives, and subsequent quitting. The people in these cases conform fairly well to processes depicted by traditional turnover models. However, 45 percent of the sample reported quitting their jobs without having actual job offers in hand. Their quitting cannot be easily explained by traditional turnover theories, particularly the acts of those individuals categorized as following decision path 1, who quit with minimal mental deliberation.

Second, the idea of a precipitating shock played a key role in the turnover process. Fifty-eight percent of the interviewees reported a shock as having an effect on their decisions to quit. Although other, potentially similar, concepts exist in the literature, including Rosse and Miller's (1984) stimulus event and Mobley's (1977) impulsive behavior, none of these concepts are as clearly articulated as shocks or as directly linked to the process of leaving (Lee & Mitchell, 1994). We recognize that considerable research remains to be done on shocks. However, the present study does provide preliminary and empirical information on types of shocks and their association with particular decision paths.

Third, the unfolding model utilizes contributions from image theory (Beach, 1990) to call into question some common assumptions in management scholars' collective thinking on turnover. Contradicting conventional wisdom, our data suggest that factors other than affect prompt the leaving process, many people do not require an alternative job before quitting, and various mismatches among values, goals, and behavioral strategies are potent issues in the turnover process. Thus, the decision to quit appears frequently to involve a process different from the rational choice among alternatives intended to optimize utilities. We hasten to mention again that our study involved only nurses who quit. Similar events or processes (shocks, image

violations) may or may not occur for stayers. To understand these turnover processes more fully, researchers need to study both stayers and leavers.

Fourth, the process of voluntary employee quitting clearly unfolds over time, but the pace and focus of leaving differ across employees, in a way presumably akin to the unfolding model's decision paths. Some people have a precipitating event; others do not. Some people decide quickly; others do not. Some people search for alternatives; others do not. Certainly, ambiguities persist. Future research might, for example, address differences in the time elapsed between an individual's (1) first thinking about quitting and making the decision to quit and (2) making the decision to quit and actually quitting. These systematic differences in time across the decision paths may constitute a new and interesting research direction.

The results of the present study also suggest implications for practice. The data indicate that quitting is more complicated than traditional turnover theories imply. For example, many people had shocks that were unrelated to their jobs or organizations. Moreover, many shocks were considered positive events. The common idea that managers can have at least a modest effect on turnover via influencing employees' satisfaction or commitment may be too optimistic and may need to be reconsidered. In addition, an almost overwhelming inference from our data is that shocks are not often about economic issues. For example, very few interviewees even mentioned compensation as an issue. Contextual issues like supervision, training, and job content appeared much more frequently than compensation as a cause for quitting. Some more specific managerial implications are suggested below.

First, the data indicate that decision path 1 involves expected and non-job-related shocks. The data also indicate that the quitting event in decision path 1 is simply a small part of a larger set of ongoing decisions about life. As a result, a manager might be unable, without heroic efforts, to alter (encourage or discourage) an act of quitting. It may be that for decision path 1 departures, managers are well advised to anticipate and manage, but not try to alter the event (by, for instance, efficiently replacing the leaver). Second, the data indicate that decision path 2 unfolds quickly and involves no detectable pattern of expected or unexpected shocks. An immediate supervisor might be poorly positioned to anticipate a shock or the subsequent quitting event. The data also indicate that the shock associated with decision path 2 most commonly involves a negative organizational event. It seems unlikely that an immediate supervisor could alter the larger organizational circumstances to affect the shock and thereby alter (discourage) the leaving. It may be that for decision path 2 departures, managers are well advised to manage events *after* the fact and not try to anticipate, manage, or alter the quitting. Third, decision path 3 involves processes that unfold more slowly; thus, a manager might be in a position to anticipate the shock and manage the subsequent quitting. The data also indicate that the shock associated with decision path 3 most commonly involves the immediate job, an area a manager may be able to influence. It may be that for decision path 3 departures, managers are well advised to try anticipating, managing, and altering quitting

events. Fourth, decision path 4 involves no shock, but unfolds slowly and is affect based. Thus managers might also be in a position to follow conventional wisdom here and are well advised to try to anticipate, manage, and alter departures via influencing employees' satisfaction or commitment.

Years ago, Kuhn (1970) wrote about normal and revolutionary science. Although the present study certainly does not represent a paradigmatic shift, it also does not represent the status quo. Studying shocks to the system, decision paths, and fittingness may substantially increase academic understanding of how and why employees voluntarily leave their jobs.

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APPENDIX

Interview and Subsequent Questions

Interview Questions

1. Can you describe the circumstances surrounding the time you first began to feel or think that you should leave your job at the hospital?
2. Was there a particular event that caused you to think about leaving? Please describe that event and the circumstances surrounding that event.
3. Were you asked to leave?
4. How soon after you began thinking of quitting did you make up your mind to leave?
5. Did you consider other job alternatives or options in making your decision?

6. Did you already have some job offers when you decided to quit?
7. Did you search for other jobs before or after you left the hospital?
8. Was the job search comprehensive? That is, how thoroughly did you gather information on other job options?
9. Did you decide that you would fit better in one of these options? If yes, could you please describe why you would fit better?
10. How would you rate the compatibility between your personal goals (which can include professional) values and those of your hospital?
11. Was your career progressing the way you expected it to?
12. Were your personal goals progressing the way you expected them to?
13. If you had stayed, would you have been able to achieve all of your career goals? Would you have been able to achieve all of your personal goals?
14. Have you ever been in a similar set of circumstances before (in terms of leaving a job)? If so, please describe what happened?
15. What's your current job? If it's not as a nurse, is it related to nursing and/or the health care area?
16. How old are you?
17. How many years did you work for the hospital full time and part time? What service did you mostly work? What shift?
18. What year did you graduate from nursing school?
19. How many dependents do you have?
20. What proportion of family income does (did) your nursing job provide?

Judgments Made by the Authors After Reviewing Interview Materials

Questions were answered "yes" or "no" unless otherwise noted.

1. Was there a clearly distinguishable and jarring event?
2. Was the event expected or unexpected? ("Expected," "unexpected," or "not applicable")
3. Was the event positive, neutral, or negative? ("Positive," "neutral," or "negative")
4. Did the event involve personal matters that were external to the job?
5. Did the event involve personal matters that were job related?
6. Did the events involve organizational matters?
7. Was the turnover incident voluntary or involuntary? ("Voluntary," "involuntary," or "not applicable")
8. Were these mental deliberations quick?
9. Did the respondent seem to believe that another job would be easy to get without a significant job search effort?
10. Did immediate job opportunities play a significant role in the turnover event?
11. Did the job search produce at least one acceptable alternative before leaving the hospital?
12. Was the job search fast or easy?
13. Was the job search long or laborious?
14. Did decision path 1 occur?
15. Did decision path 2 occur?
16. Did decision path 3 occur?
17. Did decision path 4a occur?
18. Did decision path 4b occur?
19. Did the value image fit the organization?
20. Did the trajectory image fit the organization?
21. Did the strategic image fit the organization?
22. Did not-fit lead to staying?
23. Did not-fit lead to job search?
24. Did not-fit lead to leaving?
25. Did a match occur?
26. Did scripted behavior occur?

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PERSONAL INITIATIVE AT WORK: DIFFERENCES BETWEEN EAST AND WEST GERMANY

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Personal initiative, a concept akin to entrepreneurship and organizational spontaneity, was compared in East and West Germany. Differences were hypothesized to be the results of occupational socialization, particularly of work control and complexity, rather than of a selection effect. A representative longitudinal study was conducted in the East and a cross-sectional study in the West. Lower initiative at work was found in the East; control and complexity affected changes in initiative. The results speak for socialization and against selection.

Newspapers and anecdotal evidence have suggested that there is little personal initiative in East Germany, even since the unification of East and West.¹ Managers report that they must actively find out whether an assigned task was done at all. For example, secretaries may fail to do a task because they have the wrong telephone number, even though they could obtain the number from another person. Or blue-collar workers may wait next to broken machines until a supervisor comes by, instead of looking for him or her or for a technician who could fix the machines.

Anecdotes like these may be useful as a basis for hypothesis development, but they need to be tested empirically. A study of personal initiative in East Germany may reveal something general about initiative and also begin

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¹ Although no longer politically current, the terms East and West Germany are still prevalent in familiar speech and are used throughout this article.

to illuminate psychological processes important for economic development in East Germany and in other Eastern European countries.

THE CONCEPT OF PERSONAL INITIATIVE

Recently, there has been an increasing interest in dimensions of individual performance that may influence organizational effectiveness: "intrapreneurship" (Hisrich, 1990), organizational citizenship behavior (Organ, 1988), organizational spontaneity (George & Brief, 1992; Katz, 1964), general work behavior (Hunt, Hansen, & Paajanen, 1994), and contextual performance (Borman & Motowidlo, 1993). Our study of initiative is part of this general trend.

Personal initiative is a behavior syndrome resulting in an individual's taking an active and self-starting approach to work and going beyond what is formally required in a given job. More specifically, personal initiative is characterized by the following aspects: it (1) is consistent with the organization's mission,² (2) has a long-term focus, (3) is goal-directed and action-oriented, (4) is persistent in the face of barriers and setbacks, and (5) is self-starting and proactive.

To explain personal initiative, we use action theory. Space limitations prevent describing the theory in detail here; Frese and Sabini (1985), Frese and Zapf (1994), and Hacker (1985) describe the theory, and Carver and Scheier (1982) take a similar approach. According to action theory, people always plan actions to a certain extent, although planning may take place while they are acting, and actions are guided by goals (Miller, Galanter, & Pribram, 1960). At work, tasks provide a framework from which an individual job holder develops his or her goals.

Job holders translate externally given tasks into internal tasks through a redefinition process (Hackman, 1970). For example, blue-collar workers may redefine their tasks in such a way that one of their goals is to produce a good-quality product, even though this goal was not mentioned in their contract or in the official task description. This redefinition process allows employees to define extrarole goals (cf. Staw & Boetter, 1990).

Goals may have different time frames. If a production worker is confronted with a machine breakdown, he or she may ask a repairperson to fix the machine. In this case, the worker takes a short-term approach. In contrast, the worker may use a longer time frame. He or she may recognize that the same problem is likely to reoccur and, therefore, may strive to prevent the breakdown or learn how to fix the machine on his or her own. This strategy implies thought not only about immediate problems but also about future task performance (Frese, Stewart, & Hannover, 1987). A long-term focus is an essential element of personal initiative—of overcoming problems, dealing with difficulties, and thinking of alternative ways to do a task—because it

² Obviously, employees can also develop anticompany initiative, for example, to steal effectively. This type of initiative is not considered here.

allows the person to be proactive instead of just waiting until the problem reappears.

Long-term goals have an impact only if they are translated into actions. Kuhl (1983, 1992) wrote extensively about differences in how quickly people translate intentions (goals, in our terminology) into actions. Some people may have a certain goal but do little to achieve it; Kuhl calls this "state orientation." Others quickly put goals into action, showing "action orientation." Kuhl (1983, 1992) argued that state-oriented people are more occupied with their thoughts than with their actions. Action-oriented people do not think about the problems and advantages of their goals; rather they translate these goals quickly into actions. Thus, initiative implies goal-directness and action orientation.

Employees are likely to experience problems, barriers, and setbacks in pursuing new projects and goals. A supervisor may not like a new idea, for example, or untrained actions may be poorly executed in the beginning. If an employee gives up quickly in the face of barriers, there is no initiative, which implies dealing with problems actively and persistently.

Developing goals with a long-term focus and outside role requirements, implementing these goals, and persisting in implementation allow a person to develop self-starting activities that are proactive and thus show initiative.

A number of empirical studies and theoretical analyses have suggested that personal initiative can contribute to organizational effectiveness (Borman & Motowidlo, 1993; Hunt et al., 1994; Katz, 1964; Motowidlo & Scotter, 1994; Organ, 1988). No production or service system is perfect, and unplanned events are a fact of organizational life. Thus, extrarole activities are needed in every organization, and initiative should be included as one component of a multidimensional model of nonspecific job performance.

Additionally, Hacker (1992; cf. Frese & Zapf, 1994) argued that "superworkers" (the best workers in a given department) are characterized by having a longer time perspective on their work, a better-developed mental model of their work, and a more proactive approach to work than average workers. Interestingly, the speed of working was not significantly higher in the superworkers, but their strategies were more proactive and more sophisticated. The long-term orientation and the proactive approach are also aspects of our concepts of personal initiative. The best managers are also characterized by a higher degree of initiative (Boyatzis, 1982; Klemp & McClelland, 1986).

Personal Initiative and Other Constructs

Personal initiative is related to but not identical to other constructs, such as entrepreneurship/intrapreneurship (Hisrich, 1990), organizational citizenship behavior (OCB; Munene, 1995; Organ, 1990), and organizational spontaneity (George & Brief, 1992). Entrepreneurship refers to "behaviors that include demonstrating initiative and creative thinking, organizing social and economic mechanisms to turn resources and situations to practical account and accepting risk and failure" (Hisrich, 1990: 209). Initiative is one aspect of entrepreneurship (Frese, 1995). However, initiative does not neces-

sarily have commercial implications and is, therefore, more similar to intrapreneurship (Hisrich, 1990).

Organizational citizenship behavior refers to "organizationally beneficial behaviors and gestures that can neither be enforced on the basis of formal role obligations nor elicited by contractual guarantee of recompense" (Organ, 1990: 46). Both OCB and initiative go beyond direct role requirements, and both contribute indirectly to organizational effectiveness (Organ, 1980).

However, there are also differences. OCB involves a set of five factors, two of which—altruism and compliance (Smith, Organ, & Near, 1983)—have been the most studied. In contrast to initiative, altruism is primarily related to the social sphere. Compliance has a passive connotation, referring, for example, to conscientiousness in attendance and adherence to rules. These are not part of the concept of initiative. Moreover, OCB research often assumes a supervisor's point of view, focusing on how helpful a worker is. However, supervisors often fail to support initiative and may even punish initiative approaches; this may be particularly so in Eastern Europe (cf. Pearce, Branczycki, & Bukacsi, 1994; Schultz-Gambard & Altschuh, 1993).³ Further, although initiative and OCB are both pro-organizational concepts, the time perspective each involves is different. Workers with high initiative contribute to long-range positive outcomes for organizations, but in the short term they may well be a nuisance to their bosses because they are constantly pushing new ideas. In contrast, OCB is more oriented toward a short-term, positive social orientation at the workplace.

The concepts of organizational spontaneity (George & Brief, 1992; Katz, 1964) and initiative both imply organizationally functional, extrarole, active behaviors. Thus, there is a large degree of overlap between these concepts. However, we prefer the term "initiative." Although "spontaneous" implies voluntary and self-controlled actions, it also implies lack of planning. Since initiative implies good planning, we do not want to stick to the term introduced by Katz.

Personal Initiative in East and West Germany

In East Germany's 40 years of bureaucratic socialism, people had little chance to express initiative at work⁴ (cf. Frese, 1995). Behavior by and within companies was highly regulated by central planning. Middle- and low-level management and workers had little input into how things were produced. Because there was no feedback via the market, there was little pressure to change things at workplace. As there was no competition with other companies, there was little incentive to develop high-level goals. The company

³ This historical context is one reason we did not measure OCB in East Germany; we were more interested in the rebellious element of initiative that overcomes resistance against change by a supervisor.

⁴ In activities outside work, however, a high degree of creativity and tenacity were necessary; individuals would search extensively to find ways to, for instance, build summer houses under conditions of scarcity.

goal was not to reach a high productivity level but to not make mistakes. Managers in the East were by and large more conventional and risk-avoidant than managers in the West, and they showed little independent thinking or achievement orientation (Schultz-Gambard & Altschuh, 1993). For these reasons, managers were not interested in workers' initiative and even imposed negative sanctions (Ladensack, 1990; Münch, 1990; Pearce et al., 1994; Shama, 1993).

Employees in East Germany had little control at work and low complexity in their jobs. Supervision was tight, "Tayloristic," and bureaucratic (Haraszti, 1977; Münch, 1990; Wuppertaler Kreis, 1992). Although Tayloristic job design is still prevalent in West Germany as well, there have been more attempts to increase job discretion for the workforce and to enhance workers' control and responsibility for their jobs (Ulich, 1991). Thus, both workplace factors (little control over and complexity of work) and leadership factors (negative management responses to initiative) led to a lower degree of personal initiative in East than in West Germany. Moreover, the school system contributed to a low degree of initiative (Oettingen, Little, Lindenberg, & Baltes, 1994). Accordingly, we posit:

Hypothesis 1: Personal initiative is lower in East Germany than in West Germany.

Selection of Socialization Effects as Causes of Potential East-West Differences

Differences between East and West Germany in initiative at work may be explained either by socialization or selection processes.

Occupational socialization. We concentrate here on occupational socialization because it refers to change processes in the same domain as initiative at work. Control and complexity have "socializing power" because they change skills, motivation, and orientations (Frese, 1982), and they influence initiative primarily via motivational and skill development processes.

Employees must be able to make decisions with regard to their own work and working conditions (Frese, 1989). First, low *control* at work (little autonomy or job discretion) can engender a passive and helpless approach toward work (Frese, 1989; Karasek & Theorell, 1990; Seligman, 1975). Second, employee motivation to redefine work in an enlarged (extrarole) sense is increased by sufficient environmental potential for keeping up and developing an "effectance" and mastery motive (White, 1959). Third, decision-making power enhances a worker's feeling of empowerment and increases the sense of responsibility for a job (Hackman & Oldham, 1975). Fourth, lack of control may lead to more brooding than action, increasing state orientation. Fifth, if employees expect that nothing can be done because they lack control, they are unlikely to persist in the face of setbacks.

Similar arguments can be made for *complexity*. Kohn and Schooler (1983a, 1983b) showed that the complexity of work effects an active orientation to life and a higher degree of intellectual flexibility and creativity. Work complexity leads to the development and practice of a high degree of skills

and knowledge. A high skill level fosters a long-term perspective and creativity. These contribute to developing ideas about how to change work processes and make them more effective. Knowledge and skills also help to overcome barriers and setbacks, should they occur. This is not a deterministic relationship; initiative is possible in low-skill jobs, but work complexity enhances the development of initiative.

Thus, work control and complexity help people to show more personal initiative at work. Since proponents of the socialization point of view argue that differences in control and complexity have led to differences in initiative, there should be East-West differences in work control and complexity.

Hypothesis 2a: East Germany and West Germany will differ in the degrees of control and complexity afforded to employees at work.

Hypothesis 2b: Work control and complexity have a socialization effect.

Selection effects. According to a selection perspective, people high in initiative left East Germany more frequently than people low in initiative because they suffered more from the East German regime (which repressed initiative) and because they had the initiative to actually leave. The migration of more than three million East Germans to the West since 1949 (Hahn, 1994) would therefore have produced a lower level of initiative in the East.

To our knowledge, no one has examined the initiative level of migrants from socialist East Germany; thus, one cannot test this hypothesis directly any longer. Indirect tests must suffice: First, an implication of the selection hypothesis is that initiative is mainly due to stable personality traits and thus should change little over time. This idea could be tested in our longitudinal study. Second, we could also study whether people who left the East after mid-1990 (when we began our study) had been higher in initiative prior to their leaving than those who stayed. Third, since intentions are well correlated with behaviors (Fishbein & Ajzen, 1975), it was possible to compare those who would like to leave with those who did not intend to leave East Germany.

We recognize that people who left the East before 1990 (during the period of bureaucratic socialism) may well differ from those who left after 1990. Prior to 1990, migrants and refugees often lost all their belongings and risked losing their lives or suffering imprisonment. Nevertheless, the psychological processes of voluntary migration may be similar across circumstances. If initiative was an important predictor of migration during bureaucratic socialism, it should also show up in somewhat weaker form in those who left after mid-1990.

Socialization versus selection. We find the socialization explanation of East-West differences in initiative more compelling than the selection explanation. First, personal initiative implies that a person attempts to work constructively on problems. Therefore, initiative should lead to developing active coping strategies to deal with the constraints of bureaucratic socialism

(see Parker [1993] on the relationship between perceived control and constructive dissent). Second, the selection hypothesis runs counter to our concept of personal initiative as a behavior syndrome that changes slowly because of work socialization processes.

Hypothesis 3: The evidence supporting a socialization explanation for previously hypothesized differences between East and West Germany is stronger than the evidence supporting a selection explanation.

METHODS

Study Design

There are two parts to this article: In the first, we compare cross-sectional differences between East and West Germany in initiative, control, and complexity using data collected in 1991. In the second part, we test the hypotheses regarding selection and socialization with data from a longitudinal study. We restricted the longitudinal study to the East because dramatic changes occurred only there. West Germans did not feel a difference in their daily (work) lives because of unification⁵ (*Der Spiegel*, 1991).

For the East German data, we were concerned with the period between July 1990 (time 1) and July 1991 (time 3), a year selected because drastic changes occurred during it. Table 1 explains the events and the timing of the study waves. The study began on July 4, 1990, four days after the introduction of the West German deutsche mark as currency in East Germany. At that time, workplaces in East Germany were still quite similar to what they had been before the Communist government was voted out of power in the spring of 1990. Management had not changed dramatically, although a few companies had already been bought by Western firms. The power structure was largely the same as before. At this time, there was practically no unemployment in East Germany. At the time of the third wave, the market system had been solidly introduced. Unemployment figures were around 10 percent; a large additional group of people did not have normal jobs anymore but were not considered unemployed as they were in auxiliary jobs or reskilling courses supported by the state unemployment agency. Western technology was noticeably more prevalent at work than it had been, and many high-level managers had been replaced.

Sample

Two representative samples were drawn from two circles. One was Dresden, a large city in the south of East Germany. It is the capital of Saxonia, houses a large technical university, and is well-off compared, for example, with cities in the north of East Germany. We sampled by randomly selecting streets, then selecting every third house and in each house, every fourth apartment (in smaller houses, every third one). Native Germans between the ages of 18 and 65 with full-time employment were invited to participate

⁵ This has since changed with the economic downturn in 1993.

TABLE 1
Events in East Germany and Data Collection

Date	Events	Data Collection
October and November 1989	Mass demonstrations start	
November 1989	Opening of the Berlin wall	
March 1990	First free election in the East	
July 1990	Economic unification	Time 1
October 1990	Political unification	
November 1990		Time 2
December 1990	First general election in all of Germany	
Throughout 1991	Serious economic crisis in East Germany	
May 1991		West German study
July 1991		Time 3

(thus, we sometimes had more than one person per family). The refusal rate of 33 percent was quite low for a study of this kind. Confidentiality was assured; if an individual preferred anonymity, it was provided with the help of a personal code word. All interviewees were paid for their participation.

In wave 1, 463 people participated in Dresden. For methodological reasons,⁶ we asked 202 additional people to participate at time 2. At time 3, 543 people participated. To rule out effects of experimental mortality, we compared those who dropped out between time 1 and time 3 to full participants; there were no significant differences in the initiative variables. The sample is representative of the age, social class, and gender composition of the Dresden working population.

For comparison, we chose the West German city of Mainz, which is smaller than Dresden but has similar features. It also houses a university and a state government, is relatively conservative, and contains relatively few foreigners. The selection procedure was the same as was used in the East at time 1.

Of course, any comparison between East and West German cities poses certain problems. The socioeconomic makeup of native Germans (who were the only ones asked to participate) in West German cities is different from that of those in East Germany, partly because there are more foreigners in the West, and they often occupy low-level jobs. Additionally, there was a different participation rate. West Germans, especially blue-collar workers, were less likely to participate than East Germans; the overall refusal rate

⁶ We added new interviewees at time 2 to be able to analyze the effects of participating in a study on initiative. Initiative scores of the first-timers could be compared to those of people interviewed at both time 1 and time 2 through *t*-tests. No significant differences between the two groups emerged on the core initiative scales, education, interviewer evaluation, overcoming barriers, and active approach (data not shown).

was 44 percent in the West, for an n of 160 participants. Thus, blue-collar workers were underrepresented in the West German sample, according to statistics provided by the city of Mainz.

Analysis Strategy and Potentially Confounding Variables

Because the samples' social class makeups differed and the West German sample was not quite representative for social class, mean comparisons are based on a two-way analysis of variance in which socioeconomic status was entered first. We only sampled employed individuals in the West and therefore, only those East Germans who had full-time jobs at time 3 were included in the East-West comparisons (time 3 $n = 450$ in the East).

Finally, we used multivariate analysis of covariance (MANCOVA) to control for the following additional potential confounds: marital status, partner employment, gender, and number of children.⁷

The number of respondents varies across the analyses because data are missing and certain questions were only presented to certain people (for example, probes into questions related to continuing education). When using correlations or regression analyses, we used pairwise deletion of missing data (cf. Roth, Switzer, Campion, & Jones, 1994).

Interview Procedure

Structured interviews were conducted, with additional prompts used by the interviewers as necessary. The interviewers were psychology and business students from Giessen and Dresden trained during a two-day course that included role playing, particularly on how to use prompts. Interviewers were also trained in the use of coding, and examples of the end points of the scales were provided. After time 1, each newly trained interviewer conducted a first interview together with an experienced interviewer, a practice that provided additional learning.

In these interviews, three kinds of data were collected: Objective facts (e.g., is the interviewee unemployed?), a judgment of behavior (rated by the interviewer on a five-point scale directly after the interview), and a narrative, which was submitted to coding at a later date. Interviewees' answers were jotted down by the interviewers in a short form, typed, and later used as the basis for numerical coding, with one of the coders being the interviewer him- or herself.⁸ In the third wave of data collection, the codings were culturally

⁷ Female employment was and is much higher in East than in West Germany (*Der Spiegel*, 1991). One could argue that a partner's employment (or children at home) affect orientation toward work and the taking of initiative. Age, gender, marital status (Melamed, 1995), and number of children could also be confounds.

⁸ For reasons of research economy, we did not use verbatim transcriptions of the interviews. Transcribing was not necessary because the coding system was developed beforehand and the interviewers knew which answers had to be written down to make coding possible. However, the interviewers were also trained to write down the relevant responses as word-for-word as possible; thus, the records were not just a shorthand for coding.

cross-checked—interviews done by interviewers from East Germany were recoded by interviewers from the West, and vice versa. Interrater agreements were adequate and are presented below. The means of the coding values of both raters were used in the analyses. After an interview, the interviewee was given the questionnaire to fill out at leisure (it was usually picked up after one or two weeks).

Measurement of the Interview Variables

Table 2 presents scales, Cronbach's alphas, means, standard deviations (East and West collapsed, time 3 data), and correlations; the Appendix lists the items for the scales.

Personal initiative. We think that there are problems in the use of direct questionnaire measures for initiative (Frese, Fay, Leng, Hillberger, & Tag, 1996) because social desirability bias is likely to be high unless answers can be probed (as is possible in an interview). The most important issue was that of differential anchor points. Whenever questionnaire-derived mean differences are tested across different cultures, it can be argued that people simply understand the scales differently (Poortinga & Vijver, 1987). The argument has two sides: First, if respondents compared themselves only with others from the East, they might think of their own initiative as quite high, though it was in fact low relative to West Germans'. Using a questionnaire in such a case would lead to rejecting the hypothesis that there are differences between East and West, even though there are such differences. Alternatively, because East Germans know that they are low on initiative, they might describe themselves along the lines of the popular stereotypes and thereby underrate their own initiative. This would lead to an acceptance of the hypothesis in spite of true similarities between East and West. To overcome these problems, we used interview-based measures to study the core variables.

Quantitative and qualitative initiative at work. Direct questions on past initiative were asked. If the respondent gave an example of initiative, the interviewers probed into the nature of the problem or activity, asking whether it was the interviewee's or somebody else's idea, whether other people in his or her job would also look into these problems or do these things (to ascertain extrarole behaviors), how often it was done, and so forth. If the activity was something that only required additional energy, it was coded as an example of *quantitative initiative*. If the activity addressed new problems or included new ideas, goals, or strategies going beyond what was expected from a person in the particular job (for example, a blue-collar worker's looking into a complicated production problem or a low-level supervisor's attempting to reorganize a work structure), it was deemed to be *qualitative initiative*. Qualitative and quantitative initiative were combined to form a five-point scale *general initiative at work*. Interrater correlations were .84 in the East and .89 in the West.

In addition, we developed a special subindex on *qualitative initiative*. Here, only the extremes of qualitative initiative (ratings of 4 and above)

TABLE 2
Descriptive Statistics and Time 3 Correlations^a

Interview Variables	1	2	3	4	5	6	7	8	9	10	Range	α	Mean	s.d.
Interview														
1. Qualitative work initiative		.61**	.18**	.27**	.10*	.15**	.03	-.02	.07	-.05	0-4	^b	0.44	0.74
2. General work initiative	.67**		.26**	.41**	.25**	.31**	.19**	.20**	.20**	-.16**	1-6	.74	2.15	0.78
3. Education initiative	.29**	.37**		.52**	.33**	.40**	.18**	.29**	.08*	-.20**	0-5	^b	2.13	1.63
4. Interviewer evaluation	.29**	.30**	.39**		.42**	.63**	.26**	.36**	.23**	-.32**	1-5	.93	3.75	0.85
5. Overcoming barriers	.27**	.26**	.28**	.18**		.62**	.13**	.15**	.08*	-.12**	1-6	.58(W) .70(E)	3.16(W) 2.97(E)	0.66(W) 0.74(E)
6. Active approach	.28**	.41**	.30**	.49**	.50**		.17**	.19**	.13**	-.18**	1-5	.70	3.57	0.78
7. Control at work	.22**	.30**	.14*	.22**	.14*	.25**		.50**	.29**	-.36**	1-5	.78	3.63	0.85
8. Complexity of work	.17*	.28**	.15*	.28**	.16*	.31**	.49**		.24**	-.24**	1-5	.67	3.51	0.77
9. Self-efficacy	.20**	.20**	.17*	.28**	.12	.26**	.14*	.32**		-.45**	1-5	.70	3.51	0.54
10. Control rejection	-.24**	-.28**	-.20**	-.16*	-.23**	-.23**	-.46**	-.40**	-.49**		1-5	.87	2.00	0.62

^a Correlations above the diagonal are for East Germans; those below the diagonal are for West Germans; alphas, means, and standard deviations are for the total sample except as noted.

^b Index measure.

* $p < .05$

** $p < .01$

were counted (one point was given for each coding that was 4 or higher). The coders were instructed to give a 4 or 5 if there was a high degree of qualitative initiative present. We assumed that this index would be sensitive to East-West differences because it measures the very essence of initiative. Because of the restricted variance, interrater correlations were low (East $r = .32$ and West $r = .16$).⁹ The means are very low because only a few interviewees actually had more than one case in which they showed high qualitative initiative.

Education initiative. This scale measured whether an interviewee intended to participate or participated already in some continuing education. The coding was based on what the interviewees had planned and how concrete or abstract these plans were (for example, did the person already know which course he or she would take, had he or she registered for the course, etc.) The interrater agreement was .88 in the East and .92 in the West.

Interviewer evaluation. The interviewers were asked to fill out a semantic differential scale to rate how active, initiating, and plan- and goal-oriented the interviewees were; no rating was done here because the scale was intended to give interviewers' impressions.

Overcoming barriers. Overcoming barriers is central to our concept of initiative because it is a behavioral measure; it measures a person's tenacity when confronted with obstacles to the pursuit of a goal. Our measure was inspired by the situational interview (Latham & Saari, 1984). The interviewee was asked to imagine having a certain problem—for example, a colleague who always did his or her work sloppily, requiring additional effort from the interviewee. For each problem-solving response given, the interviewer would present reasons why the selected strategy would not work, thus presenting barriers. After the third barrier (the question itself constituted the first one), the respondent was asked whether he or she could think of additional strategies. In this way, we measured how many barriers the respondent was able to overcome. Interrater agreement was .80 in the East and .86 in the West.¹⁰

Active approach. Barriers can be overcome in different ways; a search for a solution can be delegated to somebody else (for example, a supervisor) or actively pursued oneself. To get at this issue, the interviewers were asked to rate how active an interviewee's propositions for overcoming barriers were. This rating was done across the four problem situations used in overcoming barriers (no rating was done on these variables).

⁹ The low interrater reliability is due to restriction of variance. Interrater correlations for a nonrestricted version of the same items were .75 in East and .75 in West Germany.

¹⁰ At time 3, there were two different versions of overcoming barriers. Two of the four questions asked in the West were part of the time 2 interview in the East. As we wanted to have only work-related items comparing East and West Germans, we used a mixture of two time 2 and two time 3 questions in the East to equalize the content of the scales. However, when the analyses were restricted to the East, we used the original four time 3 items, which included two non-work-related items, "losing one's apartment" and "reduction of unemployment benefits."

The initiative scales have been shown to have adequate validity (cf. Frese et al., 1996) in terms of adequate intercorrelations and significant correlations with the interviewees' life partners' (spouses, etc.) judgments of the interviewees' initiative. Moreover, people who were self-employed or who wanted to become self-employed showed more initiative in the East, and those with high initiative also had clearer career plans and executed their career plans more often than those with low initiative.

Questionnaire Variables: Auxiliary and Additional Variables

Auxiliary variables. We have argued that initiative should not be measured by questionnaires. However, in the sense of triangulation (Webb, Campbell, Schwartz, & Sechrest, 1966), interview- and questionnaire-based measures should lead to similar results. For this reason, we also included two auxiliary measures, generalized *self-efficacy* and *control rejection*, in our analyses.

Self-efficacy and control rejection are conceptually and empirically close to personal initiative. Both are related to control at work. Self-efficacy—an expectation of mastery—is the opposite of work-related helplessness (Speier & Frese, 1996) and is a generalized expectancy. Since mastery expectations are prerequisites of initiative (Bandura, 1986), self-efficacy is closely related to initiative. It is relevant that Sandelands, Bockner, and Glynn (1988) presented evidence that self-esteem, a variable related to self-efficacy, is an antecedent of persistence.

Taking responsibility and wanting to take charge are prerequisites of initiative (Frese, Erbe-Heinbokel, Grefe, Rybowskiak, & Weike, 1994). We used the scale control rejection as a variable that should be related negatively to initiative (Frese et al., 1994). A high score on this variable indicates that the individual does not want control or responsibility at work. Both self-efficacy and control rejection are trait-like measures, while personal initiative is a behavior syndrome.

Additional variables. *Control at work* (Semmer, 1984) assesses job discretion in terms of, for example, ability to influence working conditions and work strategies. *Complexity of work* (Semmer, 1984) describes how difficult an individual's job decisions are. Semmer showed the ratings of subjects (blue-collar workers) and observers to be highly correlated for both variables ($r = .58$ and $r = .67$ for control and complexity, respectively). There is also evidence that people report these job characteristics with little subjective bias (Zapf, 1989).

Having left East Germany was established in September 1992, when we checked what letters had been returned to us (letters were sent to interviewees prior to the time 2 and time 3 visits) against the police register to which all German citizens must report to ascertain whether subjects had moved to the West; the interviewers also asked neighbors whether people had moved, if they could not be reached at their known addresses.

An additional set of a single-item questions addressed marital status, job of partner, number of children, and age of interviewee.

RESULTS

Cross-Sectional Study: East-West Differences in Initiative

In a first step, the hypothesis that working East Germans have a lower degree of initiative than West Germans was tested with a multivariate analysis of variance (MANOVA) with all dependent (initiative plus auxiliary) variables included; for methodological reasons, socioeconomic status (SES) was included as a factor. All multivariate effects were significant (Hotelling's test). The results reveal a significant East-West multivariate effect as suggested by our hypothesis ($F_{8,379} = 4.15, p < .01$), an effect of socioeconomic status ($F_{16,756} = 4.74, p < .01$), and an interaction effect ($F_{16,760} = 2.08, p < .01$). When the potential confounds were entered into a multivariate analysis of covariance (living alone/with partner, partner employed, age, gender, and number of children), these potential confounds had a significant multivariate influence on the dependent variables ($F_{40,1,617} = 2.22, p < .01$), but they did not change the pattern of results at all [East vs. West ($F_{8,325} = 3.59, p < .01$), SES ($F_{16,648} = 4.75, p < .01$), interaction effect ($F_{16,648} = 1.76, p < .05$)]. Accordingly, no further analyses were done with these confounds added (although SES was included in all further analyses).

These data confirm our general prediction, Hypothesis 1. Since all of the effects were significant, further univariate hierarchical ANOVAs were calculated. Table 3 reports the important results regarding East-West differences.¹¹ Because none of the interactions were significant, they are not displayed in the table. Levels of five of the eight initiative variables were significantly higher in the West, and one additional variable was nearly significantly higher; these included the most important core variables, overcoming barriers and qualitative initiative.

Interestingly, education initiative did not differ between East and West. The reason is probably that many funds are earmarked by the government for continuing education for East Germans. Interviewer evaluation—the variable that is most likely to reflect prejudices—also did not differentiate between East and West. Thus, one cannot argue that the initiative differences were due to prejudices held by the interviewers and raters.

The mean differences between East and West constituted about one-fourth to two-thirds of a standard deviation. Figure 1 presents the results for overcoming barriers in a slightly different format: Here, the group of people with high performance (a score of at least one standard deviation above the mean) on the variable overcoming barriers was singled out. In the East, 13 percent were high on this measure of taking initiative, and in the West, about three times as many had high scores (35%).

¹¹ Socioeconomic status showed significant differences in the variables in Table 5 (higher social status showing more initiative, except for self-efficacy); however, since status was entered only as a potential confound, we are not concerned with a detailed analysis of this variable.

TABLE 3
ANOVA Results: East-West Differences in Initiative^a

Variables	Time 3 Standard Deviations		Time 3 Means		ANOVA <i>F</i>
	East	West	East	West	
Qualitative work initiative	0.73	0.89	0.38	0.65	7.36**
General work initiative	0.74	0.83	2.09	2.36	3.55 [†]
Interviewer evaluation	0.88	0.76	3.74	3.88	n.s.
Overcoming barriers	0.62	0.66	2.82	3.17	17.31**
Active approach	0.78	0.71	3.54	3.81	4.08*
Education initiative	1.65	1.58	2.02	2.29	n.s.
Control rejection	0.61	0.58	2.08	1.72	19.87**
Self-efficacy	0.51	0.51	3.44	3.84	66.44**

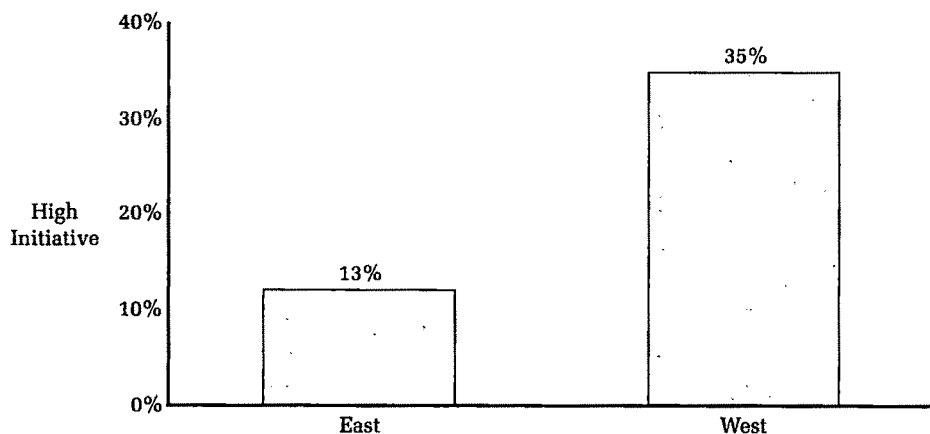
^a Hierarchical ANOVAs with socioeconomic status entered first were conducted; only employed interviewees were included in analyses. Socioeconomic status was significant for all variables except self-efficacy. All interactions were nonsignificant; ranges of *n*, 296–385 (East), 129–159 (West).

[†] $p < .10$

* $p < .05$

** $p < .01$

FIGURE 1
Percentages of People with Very High Initiative, East and West^a



^a Initiative was measured as overcoming barriers. One s.d. above mean $2.89 + .61 = 3.50$.

Longitudinal Study: Socialization Versus Selection

According to the socialization concept, control at work and work complexity should influence initiative. This implies that there should be significant East-West differences in control and complexity (Hypothesis 2a). In the two-way hierarchical ANOVAs (in which SES and East-West differences were factors), significant differences in control at work measured at time 3 appeared for SES ($F_{2,526} = 18.17, p < .01$) and for East-West differences (\bar{x} [East] = 3.52, \bar{x} [West] = 3.90; $F_{1,526} = 8.02, p < .01$). Similar results prevailed for complexity measured at time 3 (SES $F_{2,525} = 22.59, p < .01$) and East-West differences (\bar{x} [East] = 3.43, \bar{x} [West] = 3.72; $F_{1,525} = 4.53, p < .05$). None of the interactions were significant. Thus, Hypothesis 2a is confirmed.

Hypothesis 2b predicts that control at work and work complexity will change level of initiative, thus expressing a socialization hypothesis. We were able to test this question for those initiative variables for which we had both time 1 and time 3 data (qualitative and general work initiative measures were not used at time 1). Table 4 displays the single correlations and, more important, the squared multiple correlation coefficients, relating control and complexity with initiative in East and West (columns 3 and 6). These show that, on the average, control and complexity explain about 9 percent of the variance in initiative in the East and about 10 percent in the West.

To test whether control and complexity actually influenced changes in personal initiative, hierarchical regression analyses were calculated for the longitudinal study in the East (last column of Table 4). The time 1 initiative variables were entered first (and thereby, partialled out), and then control and complexity at time 3 were included.¹² The last column of Table 4 gives the increments in variance explained by control and complexity above and beyond the stability of the initiative variables. In all cases (except one that is nearly significant), there were significant increments. These results support the socialization hypothesis.

Hypothesis 3 states that there is more evidence for a socialization explanation of East-West differences than for a selection explanation. The selection hypothesis can be tested with two kinds of data. First, is there a change in East Germans' initiative between time 1 and time 3? There is evidence for a significant increase in two of the initiative variables (Table 5)¹³ and one nearly significant increase, although education initiative and self-efficacy show a reduction, with the auxiliary variable self-efficacy being marginally significant. These results run counter to what a pure selection effect would suggest.

Second, were East Germans who wanted to leave or who had actually left higher in initiative than those who wanted to stay or stayed? Only wanting to leave the East (measured at time 1) was significantly related to self-efficacy (see Table 6).

¹² Control and complexity were measured at time 3 because the effects of changed jobs could be tested then.

¹³ The variable overcoming barriers needs a comment. We used different kinds of situations as material to ask the interviewees to overcome barriers at time 1 and at time 3; this was to ensure that there would be no simple learning-from-repetition effect. However, we cannot be certain that the time 1 questions were similar in difficulty to the time 3 questions. Thus, the significant difference between time 1 and time 3 in this variable should not be taken as evidence of an increase in initiative.

TABLE 4
Correlations and Regression Analysis Results

Time 3 Variables	Cross-Sectional Study						Longitudinal Study ΔR^{2b}
	East			West			
	Correlations		R^{2a}	Correlations		R^{2a}	
	Control	Complexity		Control	Complexity		
Interviewer evaluation	.26**	.36**	.14**	.22**	.28**	.09**	.052**
Overcoming barriers	.13**	.15**	.02**	.14**	.16*	.03	.021†
Active approach	.17**	.19**	.04**	.25**	.31**	.11**	.023*
Education initiative	.18**	.29**	.08**	.14*	.15*	.03	.029**
Control rejection	-.36**	-.24**	.13**	-.46**	-.40**	.25**	.016*
Self-efficacy	.29**	.24**	.10**	.14*	.32**	.10**	.015*

^a Work control and complexity at time 3 are cross-sectional predictors.

^b Work control and complexity at time 3 entered after time 1 initiative was entered in hierarchical regression analyses to test the effect of control and complexity on change in initiative.

† $p < .10$

* $p < .05$

** $p < .01$

TABLE 5
Changes in Initiative in the East^a

Variables	Means		<i>t</i>
	Time 1	Time 3	
Interviewer evaluation	3.58	3.66	-1.72 [†]
Overcoming barriers	2.20	2.90	-14.52**
Active approach	3.06	3.45	-7.11**
Education initiative	2.49	2.02	5.10**
Control rejection	2.04	2.07	n.s.
Self-efficacy	3.47	3.43	1.86 [†]

^a The *t*-tests for dependent sample were to test changes for scales assessed at time 1 and time 3; for education, the comparison was between time 2 and time 3.

[†] $p < .10$

** $p < .01$

Table 6 shows a comparison between those who had left the East to resettle in the West (we knew of 12 individuals who had done so by September 1992) and those who stayed in the East. There is one nearly significant result (from one-sided *t*-tests); those who left the East demonstrated somewhat less qualitative initiative. In addition, four of the variables showed nonsignificantly higher means for those who had stayed. Thus, the different

TABLE 6
Comparisons of Stayers and Leavers^a

Variables	Wanted to Leave East, Time 1				Left vs. Stayed		
	Means				Means		<i>t</i>
	Yes	Maybe	No	<i>F</i>	Left East	Stayed in East	
Qualitative work initiative, time 3	0.38	0.42	0.36	n.s.	0.13	0.38	1.97 [†]
General work initiative, time 3	2.04	2.19	2.07	n.s.	1.93	2.13	n.s.
Education initiative ^b	2.13	2.19	2.00	n.s.	1.64	1.81	n.s.
Interviewer evaluation ^b	3.82	3.81	3.64	n.s.	3.36	3.45	n.s.
Overcoming barriers ^b	2.80	2.93	2.91	n.s.	2.36	2.39	n.s.
Active approach ^b	3.27	3.41	3.46	n.s.	3.27	3.18	n.s.
Control rejection ^b	2.13	1.99	2.08	n.s.	2.26	2.04	n.s.
Self-efficacy ^b	3.70	3.52	3.39	3.82*	3.47	3.39	n.s.
<i>n</i>	15	36	257		8-12	>53C	

^a By September 1992, 12 people had moved to the West; time 2 comparisons were done for leavers wherever possible; one-sided *t*-tests were used.

^b When testing for differences in "wanted to leave," we used time 3 results; when testing for differences between leavers and stayers, we used time 2 data.

[†] $p < .10$

* $p < .05$

sets of data do not provide any evidence to support a selection effect of initiative. The selection hypothesis cannot be upheld, but the socialization effect is supported by the data, confirming Hypothesis 3.

DISCUSSION

This study provides evidence that personal initiative is lower in East than in West Germany. These differences are quite robust, and they do not disappear when controls are added. As Figure 1 shows, the difference is impressive if one looks at the extremes of the distribution—representing those who matter most for organizations.

As predicted, socialization provides a better explanation of the results than does selection. Control at work and work complexity are lower in the East, and they significantly predict changes in initiative variables. The selection hypothesis was not supported by the two analyses involving people who wanted to leave and people who actually left East Germany. Although these analyses can be criticized because pre-1990 leaving may not be analogous to post-1990 migration, the selection hypothesis also assumes that initiative is a stable variable. In contrast, our results suggest that there are some slow changes.

In interpreting our results, one might argue that the interviewees either became more interested in initiative because they participated in the study or that they learned to deal with the interview questions better, showing superficial learning. However, as discussed in footnote 6, those who participated in the study twice were no different in initiative than those who participated only once.

One might also argue that the interviewers were prejudiced against East Germans. Since the initiative scales were based upon their judgments, such bias could produce differences. Three arguments speak against this interpretation. First, the auxiliary concepts that were based on the interviewees' questionnaire responses showed a pattern quite similar to that of the interview-based scales. Second, the variable interviewer evaluation, which is most strongly based on the interviewers' subjective judgment and, therefore, the most prone to be biased, did not produce significant East-West differences. Third, we had a check in the cross-cultural codings, with East German coders recording the interviews done by West Germans and vice versa.

Although only a few studies have examined psychological processes in Eastern Europe, there are some that are in line with our results. One study on self-efficacy in school children (Oettingen et al., 1994) found children in East Berlin to have lower self-efficacy and less faith in influencing their performance than those in West Berlin. Schultz-Gambard and Altschuh (1993) showed that East Germans had more conventional leadership styles and were more dependent on those above them, less self-reliant, and less achievement-oriented than West Germans. Welsh, Luthans, and Sommer (1993) evaluated different management strategies and found that participative techniques did not work in Russia.

We think that the results can probably be generalized to other Eastern European countries to a certain degree. There are similarities in upbringing, socialization, and the organization of workplaces across Eastern Europe (Frese, 1995; Haraszti, 1977; Pearce et al., 1994; Shama, 1993; Welsh et al., 1993). Additionally, all these countries have been shaken by massive changes. However, there are also differences in the transition processes. There is more interference from Westerners in East Germany than in other European countries. Thus, East Germans frequently experience a situation similar to the one that prevailed during the period of bureaucratic socialism: They are supposed to follow orders from somebody above themselves without getting any sense that their own thoughts and problem-solving approaches are important. However, this time the "somebody above" is a manager flown in from West Germany. Further, the drastic necessity to change is more salient in those Eastern European countries that receive less financial support than East Germany.

We think that this study of initiative also has general implications that go beyond Eastern Europe. First, the concept of initiative is important as one aspect of contextual performance in any society. The importance of initiative will increase with modern production systems (Womack, Jones, Roos, & Carpenter, 1990), since supervision is reduced in lean organizations and there is more reliance on shop floor employees' participating actively in organizing work, improving process and product quality, and taking care of unexpected events efficiently. None of these tasks can be put into codified form, and therefore, they rely on initiative to be done effectively.

Second, initiative may be of particular importance in change processes (Howard, 1995; Kanter, 1983). People with a high degree of initiative will also be more likely to participate in workplace changes (Frese & Plüddemann, 1993). Further, change processes cannot be programmed and prepared in such a way that nothing goes wrong. Thus, in change situations, management depends on all of an organization's employees to deal with unpredictable events and to prepare to avoid mistakes—activities that take initiative. The issue of empowerment has been important here, as is reflected in our results on control and complexity (Kanter, 1983; Wall & Jackson, 1995).

Third, the results on the influence of control and complexity on personal initiative can probably be generalized to Western countries. Although there are *mean* differences between East and West Germany, there are no *correlational* differences (the East-West correlations of the correlations displayed in Table 4 are .92 for control and .95 for complexity). Since Tayloristic production methods reduce control and complexity, this pattern implies that Tayloristic organizations run the risk of reducing their employees' initiative.

Fourth, a response of managers to employees' lack of initiative is often to "tighten the ropes" and increase supervision and outside control. Employees' degree of control at work thus declines, which can reduce initiative even further, starting a vicious cycle. Managers should be careful not to fall into this trap and should instead introduce a slow process to help increase and promote initiative.

Fifth, we assume that a certain amount of tension and conflict can develop when people from different "initiative cultures" have to work together, because their expectations of what needs to be done at work differ. This tension exists in East Germany when employees from the West do not understand why East German employees do not show initiative (Hawranek, 1990). We assume that similar problems develop when different organizational cultures collide.

In any case, one should be realistic. Certain cultures may have a lower level of initiative than others. It is fruitless to make the question of initiative a politically divisive issue to which people attach prejudices and preconceptions (as is done in Germany); rather, scientific study of initiative, its predictors, and means by which it may be increased should be pursued.

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APPENDIX

Interview Measures

Quantitative and Qualitative Initiative at Work

1. During the last two years, did you submit suggestions to improve work?
2. During last two years, did you go to see the boss, because there were problems in work?
3. Can you remember a situation during the last year in which you have you searched for causes for something that did not function correctly?
4. Have you changed something in your work during the last year (e.g., the sequence of activities, added other activities, etc.)? (Prompts were used like "how many," "which ones," "explain in detail," "have you done this by yourself or have others helped you," "do you typically do this in your job"; each item was coded as to whether it constituted qualitative or quantitative initiative on five-point scales: 1 = very little [quantitative/qualitative] initiative, 5 = very much initiative.)

Education Initiative

1. Does the subject intend to participate in some continuing education in the future? (yes, no)
2. Has s/he done something concrete to accomplish this? (1 = no concrete steps undertaken, 2 = few concrete steps [e.g., asked a colleague but not an official

- institution], 3 = some concrete steps [e.g., application], 4 = precise time is fixed, 5 = participates at the moment)
3. Has s/he actually participated in some continuing education since the last interview? (1 = did not take part, 2 = low participation [has possibly taken a small course for a few days], 3 = middle, 4 = high participation [took a longer-term qualification or longer course], 5 = very high participation [e.g., has started longer requalification training or study])
 4. Was it based on his or her own decision? (1 = company or unemployment agency demanded it, 2 = there was official demand but also interest by S, 3 = middle, 4 = there was an interest by S but also company interest, 5 = it was solely achieved by S even against resistance of company)
 5. Longer-range plans for occupational future? (1 = no plans, 2 = abstract plans, 3 = middle, 4 = plans with a certain degree of concreteness, 5 = plans with a high degree of concreteness [e.g., application])

An overall mean cut-off point was taken and only answers higher than the mean were counted.

Interviewer Evaluation

1. Active/inactive interview-dialogue behavior
2. Behaves actively/passively
3. Will behave actively/passively in the future
4. Goal-oriented/easily gets diverted from goal
5. Motivated to act/would rather not do anything
6. Wants to act quickly/wants to postpone
7. Internally controlled/externally controlled
8. Independent/not independent
9. Achievement-oriented/achievement is unimportant
10. Ambitious/not ambitious

Overcoming Barriers

1. Pretend for a moment, that you are dismissed from your job. What will you do?
2. Pretend for a moment, you want to do some further education. What will you do?
3. Pretend for a moment, your work colleague always does his/her work so sloppily that you have additional work to do. What do you do?
4. Pretend for a moment, that you work as a blue-collar worker on a machine and this machine breaks down. What do you do?

Coding: Overcoming a barrier was only counted when it was clearly a different response from the last one (e.g., not another supervisor when first answer was supervisor); interviewer stopped developing new barriers after 3 or when S could not give an answer.

Active Approach

The following rating was done for each item in "overcoming barriers": S/he is active/passive. Coding criteria for active: overcoming barrier by own activity, not delegating to others.

Questionnaire

All of the questionnaire-based measures had a five-point answer scale, most of the form "not true at all" (1) to "very true" (5).^a

^a Actually there is a translation problem here—the German word *zutreffen* is not easily translated into English.

Self-Efficacy

1. When I am confronted with a new task, I am often afraid of not being able to handle it (recoded).
2. I like to make suggestions on how to improve the work process.
3. I judge my abilities to be high.
4. If I want to achieve something, I can overcome setbacks without giving up my goal.
5. When I want to reach a goal, I am usually able to succeed.
6. In case I would become unemployed, I am convinced that, because of my abilities, I will soon find a new job.

Control Rejection

1. I do only what I am told to do. Then nobody can reproach me for anything.
2. Work is easier if I am always told how to do it.
3. You only run into trouble, if you do something on your own.
4. I would rather be told exactly what I have to do. Then I make fewer mistakes.
5. I act according to the motto: I follow order, then nobody is going to reproach me.
6. I have to think about too many things when I have to make decisions.
7. I'd rather have routine work.
8. I prefer to have a supervisor who tells me exactly what I have to do. Then he or she is at fault if something goes wrong.
9. I want to decide more things myself (recoded).
10. Work is more interesting, if one has to make many decisions (recoded).

Complexity of Work

1. Do you receive tasks that are extraordinary and particularly difficult? (1 = never, 5 = several times a week)
2. A must make very complicated decisions in his/her work, B only has to make very simple decisions. (1 = exactly like A, 5 = exactly like B)
3. Can you use all your knowledge and skills in your work? (1 = very little, 5 = very much)
4. Can you learn new things in your work? (1 = very little, 5 = very much)

Control at Work

The five-point answer scale for the following items was very little, rather little, somewhat, rather much, and very much.

1. If you look at your job as a whole: How many own decisions does it allow you to make?
2. Can you determine how you do your work?
3. Can you plan and arrange your work on your own (e.g., calculate, which material/tools you need)?
4. How much can you participate in decisions of your superior (e.g., the superior asks you for your opinion and asks for suggestions)?

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WHO SHALL SUCCEED? HOW CEO/BOARD PREFERENCES AND POWER AFFECT THE CHOICE OF NEW CEOS

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This study shows how social psychological and sociopolitical factors can create divergence in the preferences of an incumbent CEO and existing board regarding the desired characteristics of a new CEO, and how relative CEO/board power can predict whose preferences are realized. Using extensive longitudinal data, we found that more powerful boards are more likely to change CEO characteristics in the direction of their own demographic profile. Outside successors are also typically demographically different from their CEO predecessors but demographically similar to the boards.

Top management selection and succession has long been the subject of interdisciplinary research interest. Prior research has primarily sought to identify economic and behavioral factors leading to changes in CEO (e.g., Allen & Panian, 1982; Boeker, 1992; Harrison, Torres, & Kukalis, 1988; Salancik & Pfeffer, 1980) or to isolate the consequences of succession for organizational change and performance (e.g., Beatty & Zajac, 1987). However, within the CEO succession literature, there has also been some recognition that not all CEO successors are the same. For example, considerable attention has been devoted to the potential differences between insiders—those promoted from within an organization—and outsiders, those selected from outside the firm (e.g., Boeker & Goodstein, 1993; Cannella & Lubatkin, 1993; Dalton & Kesner, 1985).

Interestingly, however, research on CEO succession that considers successor attributes has generally not gone beyond the familiar insider/outsider distinction. Moreover, the meaningfulness of this distinction is somewhat unclear (Zajac, 1990). Specifically, researchers have tended to equate outsiders with differences from the status quo, an equation that begs the question of why someone recruited from outside a firm should be considered truly different from someone from within the firm, given the many dimensions upon which individuals can differ. For example, when automobile companies are seeking to appoint a new CEO, there is often considerable debate

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as to the desirability and possible organizationwide implications of choosing a "car person" versus a "numbers person." Such a debate suggests that a narrow research focus on insider/outsider CEO distinctions may be limitedly useful and potentially less relevant than a focus on other, more fundamental, distinguishing demographic characteristics of CEOs.

This omission in the management succession literature seems surprising, given emerging evidence suggesting that a variety of top management characteristics both reflect and influence the distribution of power in and strategic direction of organizations (e.g., Bantel & Jackson, 1989; Chaganti & Sambharya, 1987; Finkelstein, 1992; Fligstein, 1987; Michel & Hambrick, 1992; Wiersema & Bantel, 1992). Much of this research on top management characteristics, however, has tended to focus on cross-sectional differences in CEO or other top manager profiles and has not examined CEO characteristics (and changes in those characteristics) in the CEO succession context.

This study sought to combine these largely nonoverlapping streams of research on CEO characteristics and CEO succession by developing an original, behaviorally based framework describing the succession event in terms of the likelihood and direction of changes in fundamental top manager characteristics. Specifically, we propose that a combination of social psychological and sociopolitical factors lead prior CEOs and existing boards to favor new CEOs who are demographically similar to themselves, and that the relative influences of the two parties will predict which is more likely to realize their respective preferences. The study also examines the more traditional insider/outsider distinction by observing the degree to which outside successors are in fact demographically different from their predecessors, while also considering how performance ambiguity and social uncertainty surrounding the selection of outside CEO successors may lead boards to prefer and choose new CEOs who are demographically similar to existing board members.

PREDICTING CHANGES IN CEO CHARACTERISTICS

Before considering the possible predictors of changes in CEO characteristics, it is necessary to discuss the type of CEO characteristics examined in this study. As noted above, this study focuses on demographic attributes of CEOs. Pfeffer (1983) suggested that demographic variables furnish parsimonious and objective representations of constructs that are otherwise difficult to measure and validate, especially for corporate elites. Recent research employing demographic variables in the study of top management includes Bantel and Jackson (1989), Chaganti and Sambharya (1987), Finkelstein (1992), Fligstein (1987), Michel and Hambrick (1992), and Wiersema and Bantel (1992). These scholars—and organizational demography researchers in general—have viewed demographically similar individuals as developing comparable attitudes and a shared language by virtue of common experiences and similar choices (Allen & Cohen, 1969; Rhodes, 1983).

Thus, in terms of the present study, it also follows that observing demographic *dissimilarity* between an old and a new CEO (change in leader charac-

teristics) indicates change in leader attitudes and behavioral tendencies. For example, change in functional background, age, or educational background (degree type or affiliation) can indicate change in leadership style, personality, and attitudes on strategic issues.

A general limitation of using demographic characteristics is that one cannot determine precisely which of the many attitudinal and behavioral constructs indicated by a particular demographic characteristic is responsible for the observed relationship between that characteristic and the outcome of interest. However, this limitation would be more severe if the research objective were to relate demographic characteristics to specific strategic outcomes (e.g., Bantel & Jackson, 1989); in the present study, however, we merely presumed that demographic dissimilarity captured differences on some salient attitudinal or behavioral dimension. Moreover, given evidence that individuals use salient demographic characteristics as a basis for psychological group categorization (Stangor, Lynch, Duan, & Glass, 1992), demographic dissimilarity along salient dimensions can create the *perception* of dissimilarity in the eyes of relevant decision makers (e.g., board members and outgoing CEOs), independent of attitudinal or behavioral dissimilarity between old and new CEOs.

We now turn to introducing possible predictors of change in CEO characteristics. We begin by drawing primarily upon social psychological and sociopolitical perspectives in developing behaviorally based motives for change (as well as the expected direction of such change) and also consider the central role of relative CEO and board power in enabling different parties to act on these motives. We then consider how the economic motive of poor firm performance may interact with CEO or board power in predicting change in such a way that economic and behavioral motives combine to predict changes in CEO characteristics. Finally, we return to the more traditional insider/outsider distinction but use our behavioral framework to predict whether and how outside successors are in fact demographically different from their predecessors.

CEO/Board Influence and Changes in CEO Characteristics

Research on board decision making suggests that prior CEOs may exercise significant influence over the new-CEO selection process (Demb & Neubauer, 1992; Lorsch & MacIver, 1989). In fact, two recent studies show that a powerful CEO can minimize the likelihood of a firm's choosing an outside CEO successor (Boeker & Goodstein, 1993; Cannella & Lubatkin, 1993). However, these studies did not examine whether CEO/board power predicted changes in more fundamental demographic characteristics of new CEOs. Any discussion of the differential impact of prior CEO and existing board influence on changes in CEO characteristics must address two related issues: (1) what are the likely preferences of prior CEOs and boards regarding the characteristics of new CEOs? and (2) to what extent are prior CEOs and boards influential enough to translate their preferences into actions? This section discusses both of these issues by detailing why

prior CEOs and boards may have divergent preferences for new CEOs based on their tendencies to prefer CEO successors who are demographically similar to themselves, and then by examining the relative influence of CEOs and boards in exercising their preferences.

CEO preferences for demographically similar successors. Research on performance evaluation and hiring practices has consistently documented bias in evaluation decisions favoring ratees who are similar to raters on some dimension (Tsui & O'Reilly, 1989; Wexley & Nemeroff, 1974). Many studies on hiring decisions in particular have shown a positive relationship between applicant-rater demographic similarity and the perceived quality of an applicant (e.g., Frank & Hackman, 1975; Latham, Wexley, & Pursell, 1975; Rand & Wexley, 1975; Wexley & Nemeroff, 1974). In several of these studies, participants assessed candidates on the basis of their résumés, which contain demographic information. Related evidence suggests that demographic similarity enhances interpersonal attraction (Byrne, Clore, & Worchel, 1966; Judge & Ferris, 1993; Tsui & O'Reilly, 1989). In general, these findings are consistent with the similarity-attraction principle (Byrne, 1971; O'Reilly, Caldwell, & Barnett, 1989), which suggests that similarity on virtually any salient dimension can enhance interpersonal attraction and produce bias in evaluation decisions. Latham and colleagues wrote the following summary: "The more closely an assessee resembles the rater in attitudes or background, the stronger the tendency of the rater to judge that individual higher" (1975: 551). Although Pulakos and Wexley (1983) suggested that attitudinal similarity may be more powerful than demographic similarity in biasing evaluations, many studies have found significant effects for demographic similarity, as noted above.

Furthermore, according to Byrne and colleagues (1966), similarity provides mutual reinforcement or "consensual validation" of each individual's characteristics, thus enhancing interpersonal attraction and producing bias in evaluation decisions.¹ More recent interpretations (Tajfel & Turner, 1986; Tsui, Egan, & O'Reilly, 1992) of this finding suggest that individuals derive self-esteem and self-identity from perceived group (or "psychological group") membership. Given that demographic similarity provides a salient basis for psychological group membership (Useem & Karabel, 1986), individuals may

¹ Evaluation biases are most common where performance information is ambiguous. As Pfeffer noted, "non-bureaucratically rational factors such as social similarity, social contacts, and personal style are more likely to affect career progress in those circumstances in which objective evaluations are more difficult to obtain or less likely to be available" (1981: 250). Several researchers have argued that such "non-bureaucratically rational factors" are especially prominent in the selection of top managers (Kanter, 1977; Pfeffer, 1981; Useem, 1984). Given the unique responsibilities attending the CEO position and the difficulties inherent in attributing firm performance to particular CEO characteristics (Walsh & Seward, 1990: 430), it seems reasonable to assume that assessing the relationship between different candidates' prior performance histories, backgrounds, and so forth and their likely performance as CEO is a highly ambiguous matter.

favor (e.g., prefer to hire or promote) demographically similar individuals. Individuals may also seek to construct or maintain homogeneous groups in order to increase the salience of in-group membership, thus maintaining or enhancing their self-esteem, identity, or both. This argument is also clearly consistent with Byrne and colleagues' (1966) interpretation. Furthermore, research has consistently shown that "minimal categorizations" (group categorizations based upon irrelevant criteria) are sufficient to produce in-group bias, or discrimination favoring in-group members (Messick & Mackie, 1989; Tajfel & Turner, 1986). Thus, for example, if educational background affords a salient basis for group categorization, CEOs possessing master's degrees from Harvard Business School may favor candidates holding similar credentials, regardless of whether educational background is a meaningful criterion for CEO selection. In other words, this research suggests that demographic similarity can produce biased evaluations of job candidates independent of underlying attitudinal or behavioral similarities. Therefore, according to both the similarity-attraction principle and self-categorization theory, CEOs should prefer demographically similar replacements.

In addition to these specific social psychological mechanisms, sociopolitical interests may also impel CEOs to favor similar replacements. Specifically, qualitative studies of CEO succession suggest that top managers are reluctant to abdicate control (Sonnenfeld, 1986; Vancil, 1987). Moreover, where custom compels them to retire, CEOs may seek to preserve their legacy. As Sonnenfeld noted, "Many CEOs do not take well to the destruction of their dreams" (1986: 327). One solution to this dilemma is the selection of demographically similar successors: replacements having similar philosophies and skill repertoires are more likely to preserve a departing CEO's vision for an organization. Thus, given the social psychological and sociopolitical forces discussed above, it should not be surprising that a survey by Hambrick, Geletkanycz, and Fredrickson (1993) showed that CEOs were more likely than their subordinates to agree to the statement "The firm's ideal CEO in the Year 2000 should be similar to the current CEO."

But although CEOs may often be influential in realizing their preferences for demographically similar successors, there appears to be considerable variation in the relative influence of CEOs and boards over the CEO selection process (Lorsch & MacIver, 1989; Vancil, 1987). Although an outgoing CEO often exerts "considerable influence" over the successor choice, "for more than half the companies . . . the board is the driving force in the process" (Demb & Neubauer, 1992: 84). Given that powerful boards are less likely than weak boards to indulge a CEO's preferences for a similar successor, the extent of CEO influence over a board may be an important determinant of relative similarity (i.e., lack of change) between old and new CEOs. This suggests the following hypothesis:²

² As will be discussed in the Methods section, board power is measured four ways in this study, and changes in CEO characteristics will be measured five ways.

Hypothesis 1a: The greater the power of a firm's board in relation to its existing CEO, the greater the likelihood of change in CEO characteristics when succession occurs.

Board preferences for demographically similar new CEOs. The prior discussion emphasized CEOs' preferences for demographically similar successors and the possible conflict between CEO and board over realizing such preferences. However, the same social psychological mechanisms discussed above should also influence the preferences of board members. More specifically, to the extent that in-group favoritism and attraction toward similar others are fundamental social psychological forces (Byrne, 1971; Tajfel & Turner, 1986), board members should favor new CEOs who are demographically similar to themselves.

As noted earlier, evaluation biases are most common where performance information is ambiguous, and "non-bureaucratically rational factors such as social similarity, social contacts, and personal style are more likely to affect career progress in those circumstances in which objective evaluations are more difficult to obtain or less likely to be available" (Pfeffer, 1981: 250). Given inevitable uncertainties regarding a candidate's likely performance as CEO, boards may favor similar candidates to minimize "social uncertainty" (Kanter, 1977: 58). Similarly, boards may favor demographically similar successors in order to ensure efficient and frequent communication with the CEO and, more generally, to enhance social integration (O'Reilly et al., 1989; Useem & Karabel, 1986). As Kanter noted in a discussion of general management promotion criteria: "One way to ensure acceptance and ease of communication was to limit managerial jobs to those who were socially homogenous. Social certainty could compensate for some of the other sources of uncertainty in the tasks of management" (1977: 58).

The desire to minimize social uncertainty may also derive from sociopolitical motives, insofar as boards may believe that choosing demographically similar new CEOs can facilitate socialization attempts (Kanter, 1977; O'Reilly, et al., 1989). From this perspective, boards may favor "compatible" successor candidates (i.e., those demographically similar to themselves) in an attempt to maintain greater interpersonal influence over new CEOs. Thus, where boards have a significant role in the CEO selection process, the social psychological and sociopolitical forces discussed earlier can precipitate a change in CEO characteristics, and this change will be toward resemblance with the characteristics of existing board members.

Thus, boards who are relatively powerful vis-à-vis outgoing CEOs may not only be more likely to change CEO characteristics, but may also use the succession event as an opportunity to exercise their preference for changing CEO characteristics in the direction of existing board member characteristics.

Accordingly, we posit a second hypothesis regarding the direction—rather than just the likelihood—of changes in CEO characteristics.³

Hypothesis 1b: The greater the power of a firm's board in relation to its existing CEO, the greater the demographic similarity between a new CEO and existing board members.

In summary, this section has shown that outgoing CEOs and existing board members may both favor demographically similar successors for the social psychological and sociopolitical reasons noted above and that the degree to which these preferences are realized may be a function of the balance of CEO and board power. Taken together, the preceding discussion provides a theoretical basis for explaining and predicting what Useem and Karabel and others have argued, namely, that “the already powerful promote people most similar to themselves” (Useem & Karabel, 1986: 198).

Firm Performance, CEO/Board Influence, and Changes in CEO Characteristics

The model of CEO/board relative power developed in the preceding section contrasts with an economic-strategic model of successor characteristics by including the recognition that different parties in an organization can have divergent preferences regarding successor choice (cf. March, 1962) and that these preferences may reflect social psychological and sociopolitical forces rather than organizationally strategic imperatives. However, relative power may also interact with economic factors to influence successor choice. Specifically, boards may be particularly likely to act on the social psychological and sociopolitical motives discussed above when they have the power to do so and poor firm performance provides a reinforcing economic or strategic rationale for change. This logic suggests the following, additional hypotheses:

Hypothesis 2a: Board power and low firm performance will interact to predict an increased likelihood of change in CEO characteristics.

Hypothesis 2b: Board power and low firm performance will interact to predict increased demographic similarity between a new CEO and existing board members.

³ Hypothesis 1b is related to but analytically distinct from Hypothesis 1a. Specifically, Hypothesis 1a addresses the issue of whether powerful boards block CEOs' preference for demographically similar CEO successors, and Hypothesis 1b addresses the issue of whether boards realize their own preferences for CEO successors who are demographically similar to themselves. Positing one hypothesis but not the other would be incomplete, because each dependent variable contains unique information not contained in the other. For instance, evidence that weak boards are less able to increase CEO-board similarity does not necessarily imply that CEO characteristics remain unchanged (i.e., that successors are similar to the prior CEO)—instead, they may resemble neither the CEO nor other board members. Thus, evidence for Hypothesis 1b regarding board preferences does not fully address whether CEOs realize their preferences.

CEO Origin and Changes in CEO Characteristics

We began our discussion of changes in CEO characteristics by suggesting that the traditional focus in succession research on insider/outsider distinctions is useful but incomplete, since changes in other, more fundamental demographic characteristics have not been examined. We can now assess whether the appointment of an outsider does, in fact, usually result in a greater change in CEO characteristics. Specifically, if outsider CEOs are considered more likely than insider CEOs to function as organizational change agents (as is often assumed in the succession literature), one would expect outsiders to possess different characteristics than insiders (Hambrick & Fukutomi, 1991).

Hypothesis 3a: Outsider succession is positively related to the likelihood of change in CEO characteristics.

However, our earlier discussion of the social psychological and sociopolitical factors affecting board preferences for demographically similar CEOs suggest a modification of Hypothesis 3a. Specifically, even if outside succession represents a means of facilitating or signaling strategic change, boards face certain risks in appointing an outsider. In particular, less information is typically available regarding the abilities, values, and behavioral styles of outsider candidates than is available for insiders (Zajac, 1990). As noted earlier, the social psychological literature suggests that evaluation biases are most common where performance information is ambiguous, and this ambiguity is likely to be highest in the case of outside successors.

Moreover, whereas insider candidates share common socialization experiences with some portion of board members, outsiders may have experienced very different socialization processes (Kanter, 1977; Schein, 1968). Thus, boards may be concerned about the social and attitudinal compatibility of outsider CEOs (Demb & Neubauer, 1992: 84) and board ability to subsequently influence such CEOs. As a result, when boards consider an outside successor they may compensate for higher levels of performance ambiguity and social-attitudinal incompatibility by placing greater emphasis on demographic similarity.⁴ Thus, both the social psychological and sociopolitical forces lead to the prediction that, *ceteris paribus*,

Hypothesis 3b: Outside succession will be positively associated with increased demographic similarity between a new CEO and existing board members.

METHODS

Sample and Data Collection

The population for this study includes the largest U.S. industrial and service firms, as listed in the 1988 *Forbes* and *Fortune* 500 indexes.⁵ Firms

⁴ Note that this discussion assumes that boards have at least some influence in the selection of new outsider CEOs. Such an assumption seems justifiable, given prior research indicating that boards are generally more influential in cases of outside succession (Boeker & Goodstein, 1993; Vancil, 1987).

⁵ The *Forbes* 500 uses multiple lists whose overlap depends on the specific size measure used. This study used those firms that appeared on at least two size measures.

were excluded from the final sample if complete demographic data were unavailable for more than a quarter of the outside directors in each year. This procedure yielded 413 companies. *T*-tests revealed no significant differences in size (measured as sales and number of employees) or performance (measured as return on assets and total stock returns) between the initial and final samples.

Data were collected for the years 1986 through 1991. Demographic data were obtained from the *Dun & Bradstreet Reference Book of Corporate Management*, *Standard & Poor's Register of Corporations, Directors, and Executives*, and *Who's Who in Finance and Industry*. Data on diversification and industry concentration were obtained from the COMPUSTAT *Business Segment Tapes*. Succession was observed from 1987 to 1991 using the on-line *Wall Street Journal Index*. During the period of study, 232 successions were observed among 198 companies. Although prior theory and research has sometimes attempted to distinguish voluntary from involuntary forms of succession, such as CEO "dismissals" (e.g., Boeker, 1992), the present study is not burdened with such a task, given that both types of succession events provide firms with the opportunity to change CEO characteristics.

Dependent Variables

The following demographic characteristics were examined in this study: functional background, age, and educational background (degree type and affiliation). These particular characteristics were chosen because they are most often discussed in the existing literature. We tested the hypothesized relationships for each of the characteristics separately, as well as in combination with each other. To measure change in specific CEO characteristics, several dichotomous measures were created. Each variable was coded as 1 if the existing CEO was replaced by an individual possessing a different demographic trait and as 0 otherwise. For instance, using Hambrick and Mason's (1984) categorization (cf. Chaganti & Sambharya, 1987), *change in functional background* was coded as 1 if a CEO with primary experience in operations was replaced with an individual possessing, for instance, a marketing or legal background and as 0 if the new CEO possessed experience in operations or another throughput function.⁶ Degree type was measured as the presence or absence of an advanced management degree, and *change in degree type* was coded as 1 if a CEO with a master's of business administration (M.B.A.) was replaced by an individual not possessing one,

⁶ We followed prior research (e.g., Chaganti & Sambharya, 1987; Michel & Hambrick, 1992; Murray, 1989) in assessing functional background primarily according to an individual's current and prior job titles, while also considering other aspects of his or her employment history. Where possible, we examined information from more than one of the data sources listed above. Although coding this variable entails a degree of subjectivity, Michel and Hambrick (1992) found a high correlation (.86) between the ratings of two different sets of coders. We also correlated the ratings of two different coders for a random sample of 50 directors and obtained a correlation of .89, suggesting very high reliability.

or vice versa. Educational affiliation was measured as the presence or absence of an Ivy League degree (undergraduate or postgraduate) (D'Aveni, 1990). Prior researchers have viewed possession of a degree from a prestigious institution, such as an Ivy League school (D'Aveni, 1990), as a salient criterion for executive selection (Collins, 1979; Useem & Karabel, 1986) that also provides a meaningful basis for psychological group membership. Thus, *change in educational affiliation* was coded as 1 if a CEO possessing an Ivy League degree was replaced by an individual not possessing one, or vice versa. *Change in age* was simply measured as the new CEO's age minus the prior CEO's age.

We also developed a composite measure indicating change in CEO characteristics across multiple dimensions. This was done for two reasons. First, recent research suggests that individuals may diagnose similarity on the basis of multiple social features, so that in-group bias is more likely where individuals share multiple group memberships (Stangor et al., 1992). Second, as noted above, several empirical studies demonstrating the similarity-attraction effect in the context of hiring decisions have examined the effect of "biographical similarity" (i.e., similarity in résumé content), which captures similarity across multiple demographic dimensions, including age and functional and educational background (e.g., Frank & Hackman, 1975; Latham et al., 1975; Wexley & Nemeroff, 1974). *Change across multiple dimensions* was measured as a dichotomous variable coded as 1 if the new and old CEOs differed across all three categorical variables (functional background, educational degree type, and educational affiliation).⁷

To assess change in CEO-board similarity, we constructed four measures of demographic similarity for each company in each year. In general, similarity was assessed by aggregating measures of the similarity of all CEO-board member dyads. More specifically, age similarity was measured with an analog of the euclidean distance measure (i.e., the coefficient of variation) commonly used in research on organizational demography (O'Reilly et al., 1989; Wagner, Pfeffer, & O'Reilly, 1984), defined as

$$\left(\sum_{j=1}^n \frac{(S_i - S_j)^2}{n} \right)^{1/2},$$

where S_i is the CEO's age, S_j indicates the age of board member j , and n represents the total number of non-CEO board members. We converted this measure to an indicator of similarity by subtracting each firm's coefficient from the highest value in the sample. In general, the inverted coefficient of variation constitutes a scale-invariant indicator of similarity and has the advantage of giving proportionate weight to greater similarity (Allison, 1978).

⁷ In two separate analyses, we coded this variable as (1) change across two or more dimensions and (2) change across three or more dimensions. The findings reported below were substantively unchanged.

For the categorical variables, we applied a variant of Blau's (1977) index of heterogeneity, defined as $(P_i)^2$, where P_i is the proportion of CEO-board member dyads sharing the i th category (Murray, 1989). Thus, for functional background, this measure indicates the squared proportion of CEO-board member dyads in which both individuals have primary experience in the same core functional area; for educational affiliation and degree type, it represents the squared proportion of such dyads in which both individuals possess, or do not possess, an Ivy League degree or an M.B.A., respectively.

From these measures, we created several continuous indicators of change in demographic similarity by simply subtracting similarity with the old CEO from similarity with the new CEO. For example, *change in background similarity* equals the difference between the portion of new CEO-board member dyads sharing primary functional experience in the same area and the portion of prior CEO-board member dyads sharing such experience. The other variables capturing changes in similarity along particular dimensions (*change in age similarity*, *change in degree type similarity*, and *change in affiliation similarity*) were constructed in the same way. Finally, *change in similarity across multiple dimensions* was calculated by standardizing each change-in-similarity variable and summing them.

Independent Variables

Relative board power. This study measured the relative power of CEO and board in four ways. First, corporate governance researchers and reformers have long argued that CEO duality—joint possession of the CEO and board chairperson positions—hampers board independence and promotes managerial entrenchment (Cannella & Lubatkin, 1993; Crystal, 1991; Rechner & Dalton, 1991). In general, CEOs holding both positions possess greater formal authority and heightened informal stature relative to board members (Harrison et al., 1988; Patton & Baker, 1987), suggesting that the CEOs can exert greater influence over successor choices. *Separation of the CEO and board chair positions* is a binary variable, coded as 1 if a CEO was *not* also chairperson and as 0 otherwise.

Second, several studies have hypothesized an effect on CEO tenure, assessed relative to board members' average tenure, on the influence shares of the two (e.g., Singh & Harianto, 1989; Wade, O'Reilly, & Chandratat, 1990). High relative tenure confers expert power through a greater familiarity with an organization's resources and methods of operation (Alderfer, 1986; Zald, 1969). High-tenured CEOs may also acquire a "personal mystique or patriarchy" (Finkelstein & Hambrick, 1989: 124), resulting in sanctions against questioning their authority. Similarly, widely held behavioral norms may induce newcomers to remain silent or defer to others in board meetings (Alderfer, 1986). *Board tenure relative to CEO* was calculated as the average tenure of a firm's directors divided by its CEO's tenure.

Third, Wade and colleagues (1990) proposed a relatively direct measure of cooptation. They observed that the percentage of a board composed of outside directors appointed after a CEO was positively associated with the

likelihood of golden parachute adoption. Through control of the director-nominating process, CEOs can select individuals with whom they have personal relationships or who are otherwise sympathetic to themselves (Fredrickson, Hambrick, & Baumrin, 1988; Mace, 1971). Moreover, like insiders, these directors may feel beholden to the CEOs for their positions. Studies have found that this variable predicts a lower likelihood of succession (Boeker, 1992) and use of contingent CEO compensation (Westphal & Zajac, 1994). Boards with a greater portion of outsiders appointed before the CEO took office, on the other hand, are likely to be more influential in exercising their own preferences. *Independent outside directors* represent the number of outside (nonemployee) directors appointed before a CEO began his or her tenure divided by the total number of board members.

Finally, one of the formally defined roles of corporate board members is to participate in the CEO selection process while representing shareholder interests. Outside directors having equity investments in a firm should be particularly vigilant and active monitors of CEO behavior (Beatty & Zajac, 1994; Finkelstein & D'Aveni, 1994), challenging CEO recommendations, suggesting alternative candidates, and generally playing a larger role in the selection process. Moreover, voting rights afford additional power to owner-directors, and this power increases with the portion of total shares held (Zald, 1969). *Outsider stock ownership* was measured as the percentage of total common stock owned by outside directors (Hoskisson, Johnson, & Moesel, 1994).

Other independent variables. Given that firm performance may have a main effect on the likelihood of change, we included two performance measures as controls. *Excess stock returns* was used as a market-based measure of firm performance, calculated as cumulative daily stock returns (i.e., capital gains plus dividend payouts) in excess of returns on a market portfolio of stocks with similar systematic risk. In addition, *return on assets* was employed as an operating measure of performance. For both variables, we used the average value for the prior three years: year $t - 4$ to year $t - 1$, inclusive (while prior year performance could be most salient to board members, boards may be reluctant to change CEO characteristics after only one year of poor performance).

To test the effect of the interaction of low firm performance and board power on changes in CEO characteristics, we constructed a single interaction term based upon composite measures of each. Specifically, we standardized each performance measure by converting it to a Z-score and then summed the two standardized values into a single composite measure. We then subtracted each value from the highest value in the sample, so higher values reflect lower performance. Next, we developed a similar composite measure of relative board power using the three continuous variables discussed above (board tenure relative to CEO, independent outside directors, and outsider stock ownership). Specifically, these three variables were each converted to Z-scores and summed into a single measure. We then multiplied these two

composite variables together to generate a single interaction term.⁸ Moreover, to test Hypotheses 3a and 3b, which related outside succession to the likelihood and direction of change in CEO characteristics, we created a binary variable indicating successor origin (*outside succession*), which was coded as 1 if the new CEO was hired from outside the organization and as 0 otherwise.

Several control variables were also included in the models. First, we controlled for industry by including dummy variables at the two-digit Standard Industrial Classification (SIC) code level in all models (given the large number of primary two-digit SIC codes represented in the sample, coefficients for these variables are not reported in the tables). In addition, we also included a measure of firm *environmental instability* in all models (Duncan, 1972). To the extent that frequent changes in a firm's industry are associated with more frequent changes in leadership (Tushman & Romanelli, 1985), environmental instability may also increase the likelihood of change in CEO characteristics. We followed Wiersema and Bantel (1993) in measuring environmental instability according to absolute changes in the four-firm concentration ratio for a focal firm's three largest lines of business, weighted by each business's sales revenue. According to Wiersema and Bantel, "Large absolute changes in the firm's weighted concentration ratio would indicate high degrees of environmental instability" (1993: 493).

Moreover, given that strategic change may be associated with top management turnover (Wiersema & Bantel, 1993) and that widespread restructuring occurred among large diversified firms during the period of study (Bethel & Liebeskind, 1993), we also controlled for corporate *diversification*, using the entropy measure (Jacquemin & Berry, 1979), which takes into account the number of segments in which a firm operates and the importance of each segment as a portion of total sales. It is given by

$$\sum_{i=1}^n P_i \ln(1/P_i),$$

where P_i is the revenue share of segment i . The *logarithm of sales* was also included as a control variable in all analyses, given that inertial tendencies associated with firm size (Hannan & Freeman, 1984) could extend to leader characteristics as well as structural characteristics (cf. Dalton & Kesner, 1983). Finally, *board size* was included in all models, and several additional control variables were included in equations predicting CEO succession; these variables are described in the following section. Table 1 provides the means, standard deviations, and bivariate correlations for all data pooled.

⁸ Before multiplying the composite measures, we added a constant to each so that all values were greater than or equal to zero. Also, though separate interactions for all possible combinations of the performance and power measures could be developed, multicollinearity problems preclude including all interaction terms in a single model.

TABLE 1
Descriptive Statistics and Pearson Correlation Coefficients^a

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Excess stock returns	0.01	0.14																				
2. Return on assets	5.15	4.93	.28																			
3. Separation of CEO and board chair	0.22	0.41	.08	.05																		
4. Board tenure relative to CEO	2.67	0.43	.03	.15	.18																	
5. Independent outside directors	0.43	0.20	.06	.11	.17	.44																
6. Outsider stock ownership	0.02	0.06	.04	.13	.20	.22	.14															
7. Outside succession	0.11	0.31	-.17	-.23	.11	.09	.06	.21														
8. Logarithm of sales (in thousands)	7.98	1.22	-.06	-.06	-.07	-.09	-.02	-.17	-.04													
9. Diversification	1.22	0.37	-.06	-.04	-.06	-.03	-.07	-.11	-.02	.30												
10. Environmental instability	0.02	0.04	-.05	-.07	.13	.19	.14	.04	.07	-.10	-.20											
11. Board size	13.77	3.36	-.03	.00	-.08	-.04	-.01	.14	-.05	.14	.13	-.01										
12. Change in functional background	0.40	0.49	-.23	-.22	.18	.32	.20	.18	.17	.04	.03	.08	-.02									
13. Change in age	6.52	4.19	-.24	-.25	.21	.29	.20	.17	.24	.02	.02	.10	-.05	.54								
14. Change in degree type	0.35	0.46	-.30	-.26	.18	.25	.15	.09	.19	.02	.05	.14	-.01	.54	.51							
15. Change in educational affiliation	0.30	0.46	-.29	-.20	.25	.30	.21	.09	.23	-.01	.07	.07	-.08	.52	.49	.55						
16. Change in multiple characteristics	0.19	0.40	-.31	-.28	.27	.32	.21	.18	.23	.02	.04	.15	-.06	.56	.52	.62	.70					
17. Change in background similarity	0.08	0.07	-.21	-.21	.29	.32	.24	.19	.21	.09	.01	.13	-.04	.78	.37	.40	.43	.45				
18. Change in age similarity	2.27	1.48	-.26	-.19	.17	.23	.24	.18	.19	.06	.00	.13	-.07	.42	.80	.36	.41	.44	.58			
19. Change in degree type similarity	0.10	0.08	-.31	-.20	.20	.13	.17	.11	.23	.02	.06	.18	-.01	.38	.37	.77	.39	.40	.59	.53		
20. Change in affiliation similarity	0.13	0.08	-.25	-.21	.30	.26	.18	.09	.16	.10	.02	.14	.03	.40	.35	.31	.80	.37	.62	.64	.62	
21. Change in similarity: Multiple characteristics	0.00	3.02	-.24	-.22	.28	.30	.26	.20	.25	.11	.03	.16	-.03	.47	.43	.42	.52	.73	.81	.79	.78	.84

^a N = 232.

Analysis

To analyze change in CEO characteristics and CEO-board similarity, we used the Heckman selection model (Heckman, 1979; Maddala, 1983). This is a two-staged procedure that corrects for sample selection bias in regression analysis. Given that changes in CEO characteristics and changes in CEO-board similarity only occur when firms experience a succession event, it is necessary to correct for selection bias in analyzing these changes. The Heckman model assumes that a potential observation is observed if $x_1B_1 + u_1 > 0$, where u_1 has a standard normal distribution. In addition, there is another regression equation, $y = x_2B_2 + \sigma u_2$, where u_2 also has a standard normal distribution but is potentially correlated with u_1 with correlation ρ . In this case, the latter equation represents change in similarity or CEO characteristics, and the former represents the likelihood of succession. When ρ is significantly different from zero, standard regression analysis techniques applied to the second equation yield biased results. In other words, if error terms in both equations contain some common omitted variables, selection bias will occur (van de Ven & van Praag, 1981). For example, in the present context, if relative CEO/board power were generally more important in prompting change for the kind of firms that experience succession, specification error would be present. The Heckman procedure generates consistent, asymptotically efficient estimates for such models, allowing us to generalize to the larger population of *Fortune* or *Forbes* 500 firms.

This method is essentially a two-stage procedure that first estimates the likelihood of succession with a discrete-time event history model for the full sample and then incorporates estimates of parameters from that model into a second-stage ordinary-least-squares (OLS) regression model to predict measures of changes in CEO characteristics and CEO-board similarity for those firms experiencing succession (where the measures of change were dichotomous, rather than continuous, the second stage used bivariate probit regression [van de Ven & van Praag, 1981]). It should also be noted that sample selection models represent a more precise approach for testing our hypotheses than a single event-history model: although the reported sample size for the model as a whole is 2,065 firm-years, standard errors for coefficients of variables predicting change in characteristics (and change in CEO-board similarity) appropriately reflect only the smaller sample of those firms experiencing succession (232 firms).

To permit annual updating of the time-varying covariates, we divided the succession intervals into firm years (Amburgey, Kelly, & Barnett, 1993; Haveman, Meyer, & Russo, 1994; Ocasio, 1994). Moreover, given that firms were at risk of succession throughout the five-year time period, we treated succession as a repeatable event (Boeker, 1992; Haveman et al., 1994), assuming that a firm's likelihood of succession in a given year is independent of its prior event history (Allison, 1984; Yamaguchi, 1991). In order to minimize the consequences of potentially violating this assumption, we included three control variables suggested by Allison (1982, 1984) for repeated event models:

(1) the length of the prior interval between successions, measured in years, (2) the length of time since the prior succession, also measured in years, and (3) the number of prior successions observed during the time period (cf. Amburgey et al., 1993; Mizruchi & Stearns, 1988). To measure the first two variables, we used data on CEO succession for all firms in the sample during the prior 15-year time period and from earlier years where necessary. Moreover, to ensure that the results were not dependent upon unspecified, time-specific factors, we included dummy variables for the first four years in the sample (Allison, 1984). These dummy variables were also included in the second stage OLS-probit regressions. All independent variables were lagged by one year.

RESULTS

CEO/Board Influence and Changes in CEO Characteristics

Hypothesis 1a posits a positive relationship between a board's power (measured relative to that of a CEO) and the likelihood of change in CEO characteristics. As shown in Table 2, the results are supportive across multiple indicators of relative power. First, organizations in which the CEO is also the board chairperson are less likely to experience change in any of the four CEO characteristics or in the additional composite measure indicating change across multiple characteristics. In addition, the greater CEO tenure is relative to the average tenure of board members, the lower the likelihood of change in CEO characteristics across all five measures. Further, the portion of the board composed of insiders and outside directors appointed after the CEO (nonindependent directors) is negatively related to changes in CEO characteristics for all five measures. Finally, outside directors' stock ownership is significantly and positively related to change in functional background and the composite measure. Overall, the results support the general proposition that powerful CEOs can influence boards to appoint demographically similar successors, thus inhibiting change in CEO characteristics.⁹

Interestingly, the findings also demonstrate that economic conditions have a strong, independent effect on the likelihood of changing CEO demographic characteristics. Specifically, both measures of prior performance (excess stock returns and return on assets) are significantly and negatively related to the likelihood of change in all four CEO demographic characteristics (functional background, age, and educational background, both degree type and affiliation), as well as to the composite variable encompassing changes in multiple characteristics.

⁹ In separate models, we also analyzed change in CEO industry tenure and CEO organizational tenure as firms changed CEOs. The hypotheses were strongly supported for these additional characteristics: three of the four measures of relative board power were positively related to change in CEO industry tenure and CEO organizational tenure, and the interaction between board power and low firm performance was significant in both models (the outside succession variable was excluded from these models because it is by definition highly collinear with the dependent variables).

TABLE 2
Sample Selection Models of Change in CEO Characteristics^{a,b}

Variables	Functional Background	Age	Degree Type	Educational Affiliation	Multiple Dimensions
1. Excess returns	-2.055 (0.902)*	-6.845 (2.251)**	-2.163 (0.934)*	-2.610 (1.011)**	-3.225 (1.188)**
2. Return on assets	-0.053 (0.021)**	-0.103 (0.050)*	-0.062 (0.023)**	-0.039 (0.025)†	-0.070 (0.029)**
3. Board tenure relative to CEO	0.760 (0.330)*	1.492 (0.804)*	0.822 (0.354)*	0.632 (0.427)†	2.040 (0.539)**
4. Independent outside directors	1.591 (0.539)**	3.769 (1.313)**	1.395 (0.571)**	1.718 (0.622)**	1.523 (0.755)**
5. Separation of CEO and board chair	1.187 (0.403)**	2.500 (1.026)**	0.867 (0.417)*	1.203 (0.449)**	1.281 (0.513)**
6. Outsider stock ownership	2.182 (1.094)*	1.682 (2.579)	0.975 (1.113)	0.764 (1.184)	2.966 (1.390)*
7. Board power × low performance	0.114 (0.050)*	0.303 (0.120)**	0.121 (0.053)*	0.074 (0.060)	0.144 (0.070)*
8. Outside succession	1.304 (0.467)**	2.997 (1.165)**	0.926 (0.483)*	0.816 (0.514)†	1.497 (0.582)**
9. Log of sales	0.037 (0.046)	0.088 (0.116)	0.040 (0.046)	0.032 (0.048)	0.040 (0.054)
10. Diversification	0.345 (0.341)	0.946 (0.852)	0.272 (0.354)	0.354 (0.377)	0.419 (0.446)
11. Environmental instability	3.785 (2.008)†	7.192 (5.083)	4.053 (1.981)*	3.430 (2.042)†	3.988 (2.172)†
12. Board size	-0.021 (0.035)	-0.067 (0.088)	-0.001 (0.037)	-0.025 (0.040)	-0.031 (0.050)
13. Year 1	-0.608 (0.347)†	-0.978 (0.877)	-0.824 (0.367)*	-0.624 (0.387)	-0.815 (0.474)†
14. Year 2	-0.598 (0.325)†	-1.458 (0.813)†	-0.560 (0.336)	-0.636 (0.355)†	-0.801 (0.434)†
15. Year 3	-0.027 (0.301)	-0.344 (0.749)	-0.463 (0.314)	-0.119 (0.339)	-0.319 (0.446)
16. Year 4	0.127 (0.324)	-0.102 (0.815)	-0.137 (0.339)	-0.317 (0.358)	-0.180 (0.409)
Constant	3.092 (0.847)**	7.360 (2.139)**	3.311 (0.883)**	-3.690 (0.935)**	3.658 (1.093)**
Estimated rho	.49	.41	.45	.45	.42
Log likelihood	662.58	1,860.65	616.17	577.45	1,989.47

^a $N = 2,065$. Standard errors are in parentheses. Significance levels are results of one-tailed tests for hypothesized effects, two-tailed for control variables.

^b Coefficients of variables in the selection criterion model (i.e., event history model) are not displayed (van de Ven & van Praag, 1981). This model takes the following form: $succession_t = a + b_1 excess\ returns_{t-1} + b_2 ROA_{t-1} + b_3 relative\ board\ tenure_{t-1} + b_4 independent\ directors_{t-1} + b_5 separation\ rate\ CEO/board\ chair_{t-1} + b_6 outsider\ ownership_{t-1} + b_7 log(sales)_{t-1} + b_8 diversification_{t-1} + b_9 instability_{t-1} + b_{10} board\ size_{t-1} + b_{11} length\ prior\ interval_{t-1} + b_{12} time\ since\ last\ event_{t-1} + b_{13} number\ of\ prior\ events_{t-1} + [b_{14} year\ dummies_{t-1}] + [b_{15} industry\ dummies_{t-1}] + u_t$. The Heckman model reports a log likelihood rather than an R^2 (Heckman, 1979; StataCorp, 1995: 388).

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

Hypothesis 1a addresses whether CEO power affects the likelihood of a change in CEO characteristics, and Hypothesis 1b addresses whether board power affects the direction of such changes, predicting they will be toward similarity with existing board members. Table 3 provides results of the sample selection models relating specific sources of board power to increased CEO-board similarity. In general, the results provide strong support for Hypothesis 1b. For example, separation of the CEO and board chair positions and board tenure relative to that of the CEO are significantly and positively related to increased CEO-board similarity across all four demographic measures and the composite measure. Moreover, the portion of a board composed of outsiders appointed before a CEO (independent outside directors) is significantly related to the likelihood of increased CEO-board demographic similarity across four of the five measures. Finally, outside directors' stock ownership is significantly and positively related to increased CEO-board demographic similarity (as predicted by Hypothesis 1b) for two of the five measures: functional background and the composite measure. Thus, it appears that the presence of relatively powerful boards and poor prior performance lead to change in CEO characteristics in the direction of board member characteristics, increasing CEO-board similarity.¹⁰

Firm Performance, CEO/Board Influence, and Changes in CEO Characteristics

Hypothesis 2a brings economic and political logics together by suggesting that boards may be particularly likely to change CEO characteristics when they have the power to do so and poor firm performance provides a reinforcing economic rationale for change. In other words, Hypothesis 2a argues that board power and firm performance will interact to predict an increased likelihood of change in CEO characteristics. As shown in Table 2, coefficients for the interaction term are significant across four of the five measures, thus lending strong support to this hypothesis. Similarly, Hypothesis 2b argues that board power and firm performance will interact to predict increased demographic similarity between a CEO and board members. The results in Table 3 show that this hypothesis is supported across four of the five measures of CEO-board similarity.

CEO Origin and Changes in CEO Characteristics

Finally, Hypothesis 3a examines whether outsider succession is positively related to the likelihood of change in CEO characteristics, *ceteris*

¹⁰ We also considered whether this tendency was greatest for the most powerful subgroups of boards of directors. Specifically, rather than consider a board as a whole, we examined CEO-board similarity for the subgroup of most powerful directors (e.g., outside directors only, or outside directors appointed before a CEO's arrival). We found that increased CEO-board similarity resulting from a change in CEO characteristics was greatest for the powerful board subgroups. Thus, it appears that CEO characteristics frequently change in the direction of relatively powerful subgroups of such directors.

TABLE 3
Sample Selection Models of Change in CEO-Board Similarity^{a,b}

Variables	Functional Background	Age	Degree Type	Educational Affiliation	Multiple Dimensions
1. Excess returns	-0.083 (.044)*	-2.015 (.845)**	-0.130 (.047)**	-0.120 (.047)**	-3.755 (1.377)**
2. Return on assets	-0.003 (.001)**	-0.035 (.018)*	-0.002 (.001)*	-0.001 (.001)	-0.075 (.030)**
3. Board tenure relative to CEO	0.044 (.016)**	0.631 (.308)*	0.032 (.017)*	0.048 (.017)**	1.249 (.502)**
4. Independent outside directors	0.045 (.026)*	1.598 (.493)**	0.031 (.027)	0.086 (.027)**	1.797 (.803)*
5. Separation of CEO and board chair	0.056 (.023)**	1.159 (.447)**	0.056 (.024)*	0.051 (.024)*	1.494 (.728)*
6. Outsider stock ownership	0.090 (.052)*	0.948 (1.029)	0.037 (.055)	0.054 (.056)	2.654 (1.677)†
7. Board power × low performance	0.005 (.003)*	0.090 (.049)*	0.002 (.003)	0.004 (.003)†	0.170 (.079)*
8. Outside succession	0.057 (.025)*	1.294 (.482)**	0.069 (.026)**	0.034 (.027)	2.253 (.785)**
9. Log of sales	0.000 (.002)	0.077 (.049)	0.003 (.003)	0.002 (.003)	0.091 (.079)
10. Diversification	0.016 (.017)	0.093 (.323)	0.018 (.017)	0.010 (.018)	0.557 (.527)
11. Environmental instability	0.223 (.125)†	3.696 (2.351)	0.050 (.131)	0.262 (.134)†	6.461 (3.830)†
12. Board size	-0.001 (.002)	-0.040 (.034)	-0.000 (.002)	-0.001 (.002)	-0.029 (.056)
13. Year 1	-0.029 (.017)†	-0.429 (.332)	-0.025 (.018)	-0.034 (.018)†	-0.978 (.540)†
14. Year 2	-0.033 (.016)*	-0.455 (.316)	-0.027 (.017)	-0.025 (.017)	-0.997 (.515)†
15. Year 3	-0.014 (.015)	-0.250 (.296)	-0.013 (.016)	-0.006 (.016)	-0.109 (.482)
16. Year 4	-0.001 (.016)	0.074 (.304)	-0.003 (.016)	-0.002 (.017)	-0.005 (.495)
Constant	0.164 (.045)**	3.037 (.861)**	0.187 (.047)**	0.171 (.048)**	5.269 (1.402)**
Estimated rho	.41	.45	.44	.41	.39
Log likelihood	359.64	3,337.69	356.71	372.51	1,121.75

^a N = 2,065. Standard errors are in parentheses. Significance levels are the results of one-tailed tests for hypothesized effects, two-tailed for control variables.

^b Coefficients of variables in the selection criterion model (event history model, see Table 2) are not displayed (van de Ven & van Praag, 1981).

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

paribus, as implied (but not tested) in the traditional literature on outside succession. This hypothesis is consistently supported across all five measures, as shown in Table 2. However, the discussion leading to Hypothesis 3b further argues that even if outside succession represents a means of facilitating or signaling strategic change, boards may compensate for higher risks of social and attitudinal incompatibility attending outside succession by placing greater emphasis on demographic similarity between a CEO and existing board members. The results in Table 3 support Hypothesis 3b, showing that for four of five measures, outside succession leads to increased CEO-board similarity.

DISCUSSION

This study examined changing CEO characteristics in the CEO succession context. It extended research on why firms choose insider or outsider successors by considering more fundamental demographic characteristics of CEOs and develops an interdisciplinary framework to explain the likelihood and direction of changes in such characteristics. The study develops a theoretical framework suggesting that outgoing CEOs and existing board members may have somewhat divergent preferences regarding CEO successors, with each preferring a successor who is demographically similar to themselves. In general, our results demonstrate that the power of an outgoing CEO vis-à-vis a board consistently predicts whether the preferences of the CEO or the board will be met. Specifically, findings indicate that if the board is less powerful than the outgoing CEO, changes in CEO characteristics are less likely to occur. Furthermore, we found that if the board is more powerful than the CEO, board members tend to change CEO demographic characteristics to resemble their own demographic profile.

The underlying logic for why both parties would tend to favor similar successors was explained by the integrated social psychological and sociopolitical perspective developed earlier, and the results are consistent with that discussion. First, by taking a social psychological approach, we established that to the extent that demographic similarity provides a salient basis for in-group membership, deep-seated psychological tendencies toward in-group favoritism can lead both CEOs and board members to favor demographically similar CEOs (Byrne, 1971; Fiske & Taylor, 1991; Tajfel & Turner, 1986). Second, by taking a sociopolitical approach, we also established that outgoing CEOs and boards may both favor personally compatible (similar) successor candidates in an attempt to establish greater interpersonal influence over new CEOs and subsequent influence over organizational affairs. In effect, outgoing CEOs favor similar successors in order to preserve their legacies or visions for their organizations (Sonnenfeld, 1986), and boards prefer demographically similar new CEOs in order to facilitate socialization (Kanter, 1977; O'Reilly et al., 1989).

Given the additional, independent effect of prior performance on changes in CEO characteristics and increases in CEO-board similarity, the overall pattern of findings suggests that both economic conditions and CEO

and board power affect the likelihood and direction of change in CEO characteristics. In fact, we also hypothesized and found an additional interaction effect demonstrating that boards may be particularly likely to act on the social psychological and sociopolitical motives discussed above when they have the power to do so and poor firm performance provides a reinforcing economic or strategic rationale for change. These findings are consistent with recent research examining the role of economic and political factors in determining the likelihood of outside succession (Boeker & Goodstein, 1993; Cannella & Lubatkin, 1993) and extend that research by showing (1) how relative board power affects the likelihood of change in more fundamental demographic characteristics of top managers and (2) how a model of board power that incorporates social psychological as well as sociopolitical factors can predict the direction of such change.

A final set of results regarding outsider/insider succession provides additional insights. Specifically, we found that firms choosing outsiders are in fact likely to choose individuals whose demographic characteristics are quite different from those of the outgoing CEO. In other words, it appears that outsiders are usually different from insiders, but these differences can be attributed to more fundamental demographic characteristics, such as functional background, age, and educational background.

Interestingly, however, we also find that although outside successors are typically demographically different from their CEO predecessors, they are demographically more similar to members of the firms' boards of directors. In other words, boards of directors may seek new outsider CEOs who are different from prior CEOs, but board members also seem to have a preference for outsider CEOs who demographically resemble themselves. The fact that this tendency is greater for outsider than for insider CEO successors is consistent with the notion that boards face greater performance ambiguity and social uncertainty in evaluating outsiders and thus are more likely to rely on demographic similarity as a way to reduce that ambiguity and uncertainty (Kanter, 1977; Pfeffer, 1981). Thus, although some view outside succession as a purely adaptive response to environmental change (cf. Tushman, Virany, & Romanelli, 1985), implying that CEO characteristics will change to reflect environmental demands, our findings suggest that when CEO characteristics change, they may also reflect board member characteristics. It should also be noted that environmental variables included as controls were not as strongly predictive of changes in CEO characteristics as the CEO/board power variables.

Our study also highlights how a behavioral perspective on the role of directors in the CEO selection process can enrich existing legal and economic perspectives on boards. Specifically, although the study suggests that powerful boards can exercise greater influence in the selection of new CEOs, consistent with previous research (Boeker & Goodstein, 1993; Cannella & Lubatkin, 1993), it is not obvious that their behavior-driven tendency to choose new CEOs who are demographically similar to themselves is necessarily in the shareholders' best interests. Thus, Levinson's (1974) well-known admoni-

tion, "don't choose your own successor" might be relayed to board members as well as to the CEOs.

The present research also has implications for the top management team (TMT) literature. Theory and research on top management team composition is typically cross-sectional (Pettigrew, 1992) and treats top management demographic characteristics as given, but in this study we explicitly considered the role of social psychological and sociopolitical dynamics in determining the characteristics of top management. In other words, prior TMT research has shown that top manager characteristics may be associated with a variety of organizational decisions and outcomes; the present study contributes to such research by (1) treating top manager characteristics as endogenous, rather than exogenous, and (2) developing a model that explains and predicts how such characteristics come to be chosen. Moreover, the study also extends the level of Hambrick and Mason's (1984) upper echelon perspective by demonstrating the relevance of outside director characteristics to top management characteristics.

In addition, we hope the study contributes to research on CEO succession and CEO-board relations by highlighting the importance of organizational demography. Specifically, demographic characteristics can more precisely capture the content of CEO succession, as the earlier discussion of insider versus outsider succession suggested. Knowing a set of fundamental CEO demographic characteristics can provide more insight than simply knowing successor origin when a researcher attempts to predict subsequent CEO and firm behavior. More generally, future succession research could begin to examine the consequences of changes in CEO characteristics and changes in CEO-board demographic similarity. For example, one could examine whether new CEOs differing on multiple demographic dimensions from their predecessors are more likely to initiate major strategic changes. Also, one could examine whether increased levels of CEO-board similarity result in increased board control over a CEO. Such research could assess whether boards use social similarity with top managers as a vehicle for social control and whether doing so is a substitute or a complement to more traditional forms of board monitoring (Beatty & Zajac, 1994; Zajac & Westphal, 1994).

More generally, the study also has implications for research on business elites, in that it suggests that the capacity for "self-cloning" (Hambrick et al., 1993; Smith & White, 1987) or "homosocial reproduction" (Kanter, 1977) may be available only to relatively powerful organizational actors, and not necessarily to all members of a cohesive, unified class (cf. Useem & Karabel, 1986). Of course, this differential capacity for self-cloning requires some variance in the relevant demographic attributes. Although there is significant variance among CEOs and directors in the demographic characteristics employed in this study, our findings can be viewed as particularly strong given that our data include cases in which prior CEOs and existing directors are highly similar. Future research might investigate whether the trend toward demographic similarity continues and consider the factors (e.g., a growing demand for demographic diversity) that may reverse this trend. To the extent

that boards will be seeking greater demographic diversity in attributes such as race and gender, our study implies that boards, in an attempt to minimize social uncertainty, will place greater emphasis on demographic similarity along other dimensions.

Several limitations of the present study should also be noted. First, our sample excluded small and family-owned companies, in both of which social compatibility factors might exert less influence over successor choice. Second, our theoretical framework does not accommodate the possibility that CEOs or boards learn to overcome similarity-attraction bias over time. Future research might examine whether the biases demonstrated in this study are less pronounced as CEO and board experience with succession increases. Finally, this study, like other large-sample studies of corporate boards, does not observe directly the dynamic political processes by which structural power is exercised over board decision making (Pettigrew, 1992).

In conclusion, the findings reported in this study show how an integrated social psychological and sociopolitical perspective can illuminate the workings of the CEO succession process above and beyond traditional economic, strategic, and legal perspectives. Change in CEO characteristics reflects the social psychologically and sociopolitically influenced preferences of prior CEOs and boards, along with the relative power of these actors in realizing their divergent preferences. Thus, the study suggests that a behavioral perspective incorporating the social psychological and sociopolitical aspects of CEO succession can enhance understanding of this complex organizational phenomenon.

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CORPORATE RISK-RETURN RELATIONS: RETURNS VARIABILITY VERSUS DOWNSIDE RISK

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This study tested a model of firm risk-return relations in which risk was conceptualized in terms of downside outcomes. Drawing on the behavioral theory of the firm, we developed a set of hypotheses involving downside risk, return, and organizational slack. The hypothesized risk and return relations were tested using both downside risk and the conventional standard deviation of returns. The results indicate downside risk results in improved subsequent performance. Performance shows a negative relation with subsequent downside risk.

During the 1980s, strategic management and organization researchers gave increased attention to risk. Bowman's (1980, 1982, 1984) research pointed out the theoretical and empirical contradictions between firm-level risk-return relations and the positive risk-return relation derived from financial portfolio theory. Bowman drew attention to behavioral theory as a possible explanation for the paradoxical patterns observed in corporate risk-return data. Following Bowman's suggestion, other researchers sought to empirically test hypotheses derived from behavioral explanations of managerial risk avoidance and risk seeking. Fiegenbaum and Thomas (1988), Fiegenbaum (1990), and Jegers (1991) appealed to prospect theory (Kahneman & Tversky, 1979) to explain corporate risk-return relations. Singh (1986) and Bromiley (1991b) tested models grounded in Cyert and March's (1963) behavioral theory of the firm.

Although these studies sought to test propositions drawn from behavioral theory, their substantive findings have often been discounted because of skepticism regarding the appropriateness of using variance measures of corporate risk. Marsh and Swanson (1984) contended that risk-return relations computed as variance-mean relations in corporate accounting returns data may be statistical artifacts rather than valid tests of behavioral relations. Ruefli (1990, 1991) sought to further this line of argument, contending on statistical grounds that variance-mean relations were not meaningful. Bromiley (1991a) disputed this contention. This debate regarding the appro-

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priateness of variance measures is critical to evaluating the findings of prior behavioral research and may also prompt a reevaluation of the findings of other branches of strategy research incorporating variance measures of risk, such as research on corporate diversification.¹

This controversy regarding appropriate measures of organizational risk has largely suppressed the question of the conceptual validity of variance measures. We bring the validity question to the forefront by questioning whether variance measures adequately capture the concept of risk relevant to managers. In the opening section of this article, we contend that rather than supporting variance concepts of risk, management theory and studies of managers' understandings of risk point to the potential for poor performance as the essence of risk.

The primary objective of this study was to test a behavioral model of firm risk-return relations in which risk is conceptualized in terms of downside outcomes rather than outcome variance. We drew from the behavioral theory of the firm (Cyert & March, 1963) to develop testable hypotheses regarding relations between downside risk and organizational performance. These relations become explicit in a two-equation model of relations between downside risk and return allowing for moderating effects associated with organizational slack.

The behavioral theory of the firm has been around for more than three decades, but empirical studies such as those by Singh (1986) and Bromiley (1991b), examining risk-return models directly incorporating the constructs of performance, aspirations, and slack and using actual organizational data, are quite rare.² March's own work based on the behavioral theory of the firm has concentrated on simulations (cf. March, 1988a). Other researchers (Lant, 1992; Lant & Montgomery, 1987) have looked at group decisions in simulated organizations (i.e., using a marketing strategy game). The theory merits further investigation using actual organizational data.

In developing operational measures of the variables in our behavioral model, we introduce a general category of measures of firm downside risk; these measures are specified as weighted functions of below-target returns. The particular class of downside measures examined in this study incorporates historical accounting returns.

¹ Despite the unresolved state of this debate, the criticisms of variance measures have prompted researchers to explore alternative risk proxies. Bromiley (1991b) advocated the use of risk measures capturing the *ex ante* uncertainty of returns reflected in the variance among stock analysts' earnings forecasts. Oviatt and Bauerschmidt (1991) measured risk as the variability in returns around the time trend in a firm's accounting returns data. Ruefli and Wiggins (1994) subsequently criticized the measure used by Oviatt and Bauerschmidt on the basis that under certain conditions it converges to returns variance—an inappropriate measure for examining risk-return relations if Ruefli's earlier (1990, 1991) contentions are accepted (see Appendix B).

² Singh's (1986) cross-sectional model of risk taking found performance to have a negative relation. Bromiley (1991b) found performance reduced subsequent firm risk, and risk reduced subsequent performance. Results regarding organizational slack differed across these two studies.

Tests of the behavioral model indicate downside risk results in improved subsequent performance. Performance, however, shows a negative relation with subsequent downside risk. Correlation and regression analyses using data from U.S. manufacturing companies indicate the choice between downside and variance measures has substantive implications for estimated risk-return relations. This finding alerts strategy and organization researchers to the need to explicitly consider the conceptual validity of variance and downside measures in specifying and testing theoretical models.

THEORY AND HYPOTHESES

Behavioral Theory and Downside Risk

In the behavioral theory of the firm, Cyert and March (1963) sought to describe the way in which organizations make decisions. The theory focuses on internal organizational decision criteria and processes. In developing it, Cyert and March gave extensive attention to organizational performance and aspirations as determinants of managerial choices, indicating that organizations measure performance along multiple dimensions, including production, inventory, sales, market share, and profitability. The degree of emphasis on any particular dimension of performance is driven by top management priorities and previous experience. Following the stream of research on risk-return relations, we focused on a profitability measure of performance; however, the discussion could be extended to other organizational performance dimensions.

Not only do managers measure performance—they also formulate aspirations as benchmarks for assessing performance. Performance that falls short of aspirations motivates organizational change. Describing the adaptation of organizational aspirations, Cyert and March stated the following: "We assume, therefore, that organizational goals in a particular time period are a function of (1) organizational goals of the previous time period, (2) organizational experience with respect to that goal in the previous period, and (3) experience of comparable organizations with respect to the goal dimension in the previous time period. Initially at least, we would assume a simple linear function, $G_t = a_1 G_{t-1} + a_2 E_{t-1} + a_3 C_{t-1}$, where G is the organizational goal, E the experience of the organization, C a summary of the experience of comparable organizations, and where $a_1 + a_2 + a_3 = 1$ " (1963: 123). Subsequent research supported the contention that managers' assessments of performance are framed in terms of aspiration levels (Lant, 1992; Lant & Montgomery, 1987; Milliken & Lant, 1991).

Studies of managers indicate the performance and aspiration constructs found in the behavioral theory of the firm are central to managers' concepts of risk. Mao (1970) found executives characterized risk in terms of failure to meet a target rather than in terms of variance. March and Shapira (1987) reported that 80 percent of the executives they surveyed considered only negative outcomes when thinking about risk. Baird and Thomas's (1990) survey results indicated financial analysts specializing in six different indus-

tries considered the size and probability of a loss the most important of seven risk definitions. Hence, managerial surveys suggest that downside concepts of risk—those specified in terms of failure to perform at an aspired-to level—are much more relevant to practicing managers than performance variability, which includes both upside and downside outcomes.

Furthermore, discussions of risk in the strategy literature frequently reflect the view of risk as failure to perform at an aspired level. For example, as Aaker and Jacobson stated, "Marketing and strategy are primarily concerned with avoiding decreases in expected return" (1990: 153). They noted that although new entry into an industry may leave the returns variability of incumbent firms unchanged, entry can lower expected returns. It is this potential for reduced future performance, rather than a change in the variability of future returns, that constitutes risk. Similarly, Porter, in discussing corporate risk management, stated the following: "Risk is a function of how poorly a strategy will perform if the 'wrong' scenario occurs" (1985: 476). Hoskisson, Hitt, and Hill (1991) asserted loss aversion, rather than variance aversion, characterizes strategic decision makers' risk preferences.

Despite the apparent relevance of downside risk for managers and strategy theorists, empirical strategy and organizational research continue to employ operational measures of risk reflecting variability in accounting or stock returns. Such variability measures fail to differentiate upside and downside outcomes—a distinction fundamental to the risk assessments of managers. Noting this inconsistency, March and Shapira concluded, "There is, therefore, a persistent tension between 'risk' as a measure (e.g. the variance) on the distribution of possible outcomes from a choice and 'risk' as a danger or hazard" (1987: 1407). Recognition of the discrepancy between downside and variability concepts of risk raises questions about the validity of variance risk measures and the conclusions obtained from empirical research using such measures.

Hypotheses

Focusing on a downside concept of risk requires rethinking the implications of behavioral theory for risk-return relations. The discussion in this section generates a set of hypotheses grounded in the behavioral theory of the firm (Cyert & March, 1963). The hypotheses relate downside risk and organizational performance. Following behavioral theory, the hypotheses also reflect the role of organizational slack in determining risk-return relations. Unlike previous research, this study tested behavioral hypotheses conceptualizing risk in terms of below-target outcomes rather than performance variability.

According to Cyert and March (1963), when performance falls below the level of aspirations, organizations respond by initiating searches for alternative routines. Such managerial attention to performance that falls short of a target level is consistent with downside conceptualizations of risk. Deficiencies in performance relative to aspirations stimulate searches designed

to generate alternatives that will resolve performance shortfalls.³ Since searching is costly, failure to achieve a desired performance level may reduce short-term performance. However, the behavioral theory of the firm suggests that search continues in a sequential fashion until the organization encounters an alternative with an expected performance exceeding the aspiration level. It is assumed that the profit generated by this solution more than offsets the short-term cost associated with search. As a result, the behavioral theory of the firm suggests a failure to reach aspired-to performance levels will result in new routines that lead to improved subsequent performance.⁴

The hypothesized positive relation between downside risk and subsequent performance is unlikely to be evident in cross-sectional research unless a control for prior performance is included. Although there could be exceptions, firms that consistently perform above their aspiration levels are likely to maintain higher performance than those that perform at levels lower than they have aspired to. Thus, in the absence of a control for prior performance, cross-sectional analysis is likely to render a negative relation between downside risk and performance. The more interesting issue is whether or not downside risk results in a relative improvement in a firm's own performance. By controlling for prior performance, we isolate the effect of downside risk on performance relative to a firm's own prior performance.

Hypothesis 1: With prior performance controlled, downside risk has a positive relation with subsequent financial performance.

The behavioral argument underlying Hypothesis 1 rests on the assumptions that downside risk focuses managers' attention on problem solving and that the ensuing search results in the identification and implementation of a performance-enhancing alternative organizational strategy.⁵ These are disputable assumptions. A plausible alternative to Hypothesis 1 is that organizations are dominated by inertia and fail to respond to downside risk with performance-enhancing changes. The view that inertia, rather than managerial strategic choice, characterizes organizations is most strongly asserted in population ecology (e.g., Hannan & Freeman, 1977). Elsewhere in organization theory, there is a recognition that although organizations have inertial

³ Puffer and Weintrop (1991) found shortfalls in actual financial performance relative to analysts' forecasts were associated with CEO turnover, a finding consistent with the contention that performance shortfalls motivate change.

⁴ We are indebted to an anonymous reviewer for drawing attention to the importance of the time dimension in specifying relations between downside risk and return. In an earlier version of this work, we assumed a relatively short time frame and, owing to adjustment costs, hypothesized a negative relation between downside risk and subsequent performance. By contrast, the present statement of Hypothesis 1 is in agreement with Cyert and March's (1963) behavioral theory of the firm and is consistent with the five-year time frame used in our empirical analyses.

⁵ As Cyert and March stated, "We have argued that failure induces search and search ordinarily results in solutions" (1963: 278).

tendencies, a concerted effort for change is, nevertheless, possible (e.g., Hedberg, Nystrom, & Starbuck, 1976). The absence of empirical support for a positive relation between downside risk and subsequent performance would be consistent with the inertial hypothesis.

The behavioral theory of the firm contains no explicit statement about the nature of the particular strategic changes adopted in response to downside risk. It does not address what strategies enhance organizational performance. The behavioral theory of the firm is a theory of organizational choice, not competitive advantage. It should be acknowledged, however, that changes in strategy mediate the relation between downside risk and subsequent financial performance and, hence, the hypothesized relation between downside risk and financial performance is not directly causal.

A further implication of the behavioral theory of the firm is that firms with strong financial performance will not undertake searches for alternative strategies. Firms avoid uncertainty unless performance shortfalls motivate problemistic search (Cyert & March, 1963). Thus, high-performance firms avoid the cost and performance uncertainty associated with searching for alternative strategies and should experience less subsequent downside risk than low-performance firms.

Behavioral theorists (e.g., Singh, 1986) motivated by prospect theory (Kahneman & Tversky, 1979) have also contended that poor performers are more likely than high performers to engage in risky strategies. Kahneman and Tversky found individuals exhibit risk-averse behavior for probabilistic choices involving gains and risk-seeking behavior for choices involving losses. Bowman (1980, 1982, 1984) and Fiegenbaum and Thomas (1986, 1988) extended prospect theory from analysis at the individual level to organization-level risk preferences. Prospect theory suggests that poorly performing firms may take greater risks than strongly performing firms. Such risky strategies may have low expected values, but the firms expect eventually that some strategic gamble will improve firm performance. Strong performers, on the other hand, may reduce their risk-taking strategic initiatives. Hence, both the behavioral theory of the firm and prospect theory arguments support the contention that strong financial performance decreases organizational downside risk and that poor performance increases it.

Since downside risk is a function of performance relative to an aspiration level, empirical results supporting a negative relation between performance and subsequent downside risk could be due simply to autocorrelation in firms' returns data. Hence, testing this relation requires controlling for prior downside risk. In so doing, we isolate the changes in downside risk attributable to prior performance. The following illustrates the reasoning behind controlling for prior downside risks: in any given period, it is quite possible for two firms to have the same level of downside risk yet very different average performance levels. This pattern could be a result of one firm's having some large positive deviations from its aspiration level during the period while the other does not. We would expect the firm with higher average performance to experience a greater reduction in downside risk than the firm

with lower average performance. Thus, if we control for prior downside risk, finding performance has an impact on subsequent downside risk would be a substantive result.⁶

Hypothesis 2: With prior downside risk controlled, financial performance has a negative relation with subsequent downside risk.

The behavioral theory of the firm introduces organizational slack as a moderator of organizational responses. Hence, a well-specified behavioral model of downside risk-return relations must incorporate organizational slack. Organizational slack resources accumulate during periods of performance above aspirations and diminish during periods of unsatisfactory performance. As such, slack provides a cushion allowing organizations to maintain more stable aspirations when faced with performance variability than would be possible without slack resources (cf. Cyert & March, 1963: 36–38). Slack determines an organization's motivation to seek out revenue-enhancing changes in operating routines and strategies in response to performance shortfalls. The intensity of search is greater where organizational slack is low than when it is high (Cyert & March, 1963: 80). Since high-slack firms are less likely to undertake searches for new strategies when faced with downside risk, downside risk has a less positive impact on subsequent financial performance for high-slack firms than for low-slack firms. Sharfman Wolf, Chase, and Tansik (1988) also made the claim that slack absorption allows firms to postpone changes when short-term performance falls below aspirations.

Hypothesis 3: Slack attenuates the positive effect of downside risk on subsequent financial performance.

Although slack is expected to be a significant moderator of the impact of downside risk on financial performance, the total effect of slack on financial performance is unclear. Cyert and March (1963: 278–279) proposed that organizations benefit from “slack innovation,” that is, innovation that arises through experimentation that would not be undertaken in a slack-constrained organization. The possibility of slack innovation argues for a positive direct effect of slack on subsequent performance. Cyert and March were careful to characterize slack innovation as distinct from problem-driven innovation, the primary focus of their theory. Although slack may allow firms to experiment and take advantage of opportunities, its buffering effect serves to reduce “problem-oriented innovation” (Hypothesis 3). The net result of these offsetting effects is not apparent. Hence, we did not expect the combined effects

⁶ This approach is consistent with that of Lant and Montgomery (1987), who found risk taking (formulated as variance or uncertainty) to be positively related to past risk and negatively related to past attainment discrepancy (performance minus aspiration level) for players of a marketing strategy game.

of slack on performance (both direct and in interaction with downside risk) to be significant.

Slack was expected to have both a direct and a moderating effect on subsequent downside risk.⁷ These relations are summarized in Hypotheses 4 and 5. First, regarding the direct effect of slack on downside risk, the presence of slack resources is expected to allow firms to undertake investments reducing subsequent downside risk. Firms with slack resources formulate responses to a greater range of environmental contingencies than do resource-constrained firms (Cohen, March, & Olsen, 1972). In so doing, high-slack firms reduce their downside risk relative to low-slack firms. This argument coincides with Thompson's (1967) contention that firms use slack resources to buffer their "technological cores."⁸

Hypothesis 4: Slack reduces subsequent downside risk.

Slack should also demonstrate a moderating effect on the relation between firm performance and subsequent downside risk. Risk reduction through investment of slack resources is likely to be particularly evident in high-performance firms. That is, the managers of organizations performing well should be more predisposed than managers of poorly performing organizations to use slack resources to buffer their organizations from downside risk. By contrast, managers of poor performers may not be inclined to buffer their maladapted organizations through slack investments.

Hypothesis 5: Slack enhances the negative effect of financial performance on subsequent downside risk.

In addition to testing these five hypotheses, this study had the further objective of contrasting the empirical implications of using downside and variability measures of risk. In the earlier discussion of variability and downside risk, we argued that downside risk is the more managerially relevant concept of risk. If downside measures have greater validity than variability measures, the former should provide greater explanatory power than the latter in a behavioral model of risk-return relations. We did not develop specific hypotheses relating variability risk measures and return, but the empirical results presented below are based on both downside and variance risk measures. This approach allows comparisons between the measurement properties of downside and variability risk in behavioral models.

⁷ Bromiley (1991b) specified a model with nonlinear effects of slack on risk and performance. The estimated coefficients associated with slack squared were generally not significant at the .05 level. Given the lack of empirical evidence and convincing theoretical arguments for the inclusion of slack squared and the potential for collinearity problems with the inclusion of both direct and quadratic forms in the same model, we have chosen not to include a quadratic slack variable.

⁸ This hypothesis contrasts with Jensen's (1986) free cash flow hypothesis, which would lead to the alternative hypothesis, that organizational slack increases downside risk because of agency problems.

RESEARCH DESIGN

Model Specification

The model consisted of two equations. The primary relations are those between risk and subsequent return and the effect of return on subsequent risk. The time period subscripts indicate the time lags incorporated into the model. The bilinear moderating effect of slack on the relations between risk and return is incorporated as a multiplicative term in each equation (cf. Jaccard, Turrisi, & Wan, 1990). Slack also enters the model as a direct effect. Partialing the direct effect from the product terms is necessary for interpreting the *t*-statistic associated with the risk-by-slack and return-by-slack interaction terms (Cohen, 1978). The two equations are as follows:

$$\text{Return}_t = b_0 + b_1\text{risk}_{t-1} + b_2\text{slack}_{t-1} + b_3\text{risk}_{t-1} \times \text{slack}_{t-1} + b_4\text{return}_{t-1} + b_5\text{industry return}_t + e_t \quad (1)$$

For Hypothesis 1, $b_1 + b_3\text{slack}_{t-1} > 0$; for Hypothesis 3, $b_3 < 0$.

$$\text{Risk}_t = c_0 + c_1\text{return}_{t-1} + c_2\text{slack}_{t-1} + c_3\text{return}_{t-1} \times \text{slack}_{t-1} + c_4\text{risk}_{t-1} + c_5\text{industry risk}_t + e_t \quad (2)$$

For Hypothesis 2, $c_1 + c_3\text{slack}_{t-1} < 0$; for Hypothesis 4, $c_2 + c_3\text{return}_{t-1} < 0$; for Hypothesis 5, $c_3 < 0$.

The hypotheses under each regression equation summarize the expected relations developed in the previous section. In Equation 1, the *t*-statistic for the coefficient b_3 provides a test for Hypothesis 3, positing a moderating effect of slack_{t-1} . Risk_{t-1} has both a direct and a slack-moderated effect on return. Hence, the total effect of risk_{t-1} on return_t is given by the partial derivative of Equation 1 with respect to risk_{t-1} , that is, $b_1 + b_3\text{slack}_{t-1}$. This expression makes clear that the relation of risk_{t-1} on return_t is a linear function of slack_{t-1} . Similarly, in Equation 2, the total effects of return_{t-1} and slack_{t-1} are given by the partial derivatives with respect to each of these terms.

Controls. Previous strategy research indicates that numerous firm-specific and industry variables affect organizational risk and return. Our focus was on developing a parsimonious model consistent with the behavioral theory of the firm, but it was important to include appropriate organizational and industry controls. The lagged dependent variable and contemporaneous industry effects are included as controls for other variables that have an impact on risk and return but are not explicitly considered in the behavioral theory of the firm. The lagged dependent variable controls for firm-specific factors affecting return or risk across time periods. Thus, the lagged risk and return variables are expected to be positively related with the same variables in the subsequent period ($b_4 > 0$, $c_4 > 0$). As noted in the development of the first two hypotheses, the lagged dependent variables express the downside risk-return relations in the context of a firm's prior risk and return.

The contemporaneous industry effect controls for differences in performance and risk across industry categories. Previous research has indicated the importance of industry controls in modeling risk-return relations (Bow-

man, 1980; Fiegenbaum, 1990; Fiegenbaum & Thomas, 1985, 1986). Contemporaneous measures of risk and return serve as proxies for the attractiveness of an industry's structure. The industry return term in the return equation includes contemporaneous performance by all other firms in the same two-digit Standard Industrial Classification (SIC) industry. That is, a firm's own return is not included in the industry return for that observation. If industry structure affects performance, average returns by other firms in the industry should be positively related to returns for any particular firm [$b_5 > 0$].

Similarly, the risk equation incorporates a measure of contemporaneous average risk for all other firms in a two-digit SIC industry. High average industry downside risk indicates the presence of firms with large performance deviations below aspirations. The persistence of such firms in an industry may indicate high exit barriers and, hence, higher risk for all firms in the industry. A general decline in industry performance would raise average industry downside risk. Average downside risk is expected to be positively related to downside risk for a particular firm in the industry ($c_5 > 0$).

Lag structure. Although it has been widely argued that risk affects return and vice versa, one of the difficulties in specifying a model of risk-return relations is inadequate understanding of the timing of these effects. As Bromiley (1991b) pointed out, most previous studies in the strategy field have used cross-sectional data to estimate risk-return relations. These studies make causal arguments relating risk and return but model risk and return as having contemporaneous effects on each other. An alternative to estimating contemporaneous risk-return relations is to specify a lagged model in which risk affects subsequent return and vice versa. Although model specification with temporal ordering of risk and return variables does not necessarily indicate causality, reverse causation can be ruled out (Kenny, 1979: 2-4). That is, a variable measured in one period does not cause variables measured in earlier periods.

Specifying a model with lagged relations between risk and return is consistent with causal theoretical arguments, such as those of the behavioral theory of the firm, but the appropriate lag structure for such models is unclear. Miller and Bromiley (1990) found significant relations using a model in which risk in one five-year time period explained return in the subsequent five-year period. Bromiley (1991b) modeled risk in one year as affecting return in the following year and vice versa.

Given the unique characteristics of organizations and investment projects, it would be difficult to make any generalization regarding the appropriate lag structure for risk-return relations. Although other lag structures may be reasonable, this study used five-year periods to specify the lags in modeling risk-return relations. The first equation models average return over a five-year period as a function of downside risk measured over the previous five-year period. The risk equation uses average return in a period to explain risk in the subsequent five-year period. The slack, industry risk, and industry return variables were also computed as five-year period averages.

Since lagged effects of downside risk on return and vice versa are consistent with the behavioral theory of the firm, we did not model a contemporaneous risk-return relation. Hence, the proposed cross-sectional model differs from the theoretical perspective reflected in other research modeling contemporaneous risk and return as a system of simultaneous equations (e.g., Oviatt & Bauerschmidt, 1991). Since cross-sectional estimation of Equations 1 and 2 involves no endogenously determined explanatory variables, use of ordinary-least-squares estimates was appropriate (Kennedy, 1985: 126–127).

Temporal stability. Fiegenbaum and Thomas (1986) found risk-return relations differed over time. Ruefli (1991) and Baucus, Golec, and Cooper (1993) also questioned the temporal stability of corporate risk-return relations. Hence, each of the regression models was estimated cross-sectionally for three distinct periods to allow testing for the stability of the regression coefficients over time.

Measures and Sample

Return. Return on equity (ROE) and return on assets (ROA) are two common accounting-based measures of performance. Both measures are highly correlated. Furthermore, both have been used to compute highly correlated accounting-based risk measures in previous strategy research (Miller & Bromiley, 1990). This study used average ROA over the five-year period as the return measure. ROA does not vary with changes in financial leverage, as does ROE.

Risk. For each firm, downside risk was measured as a function of the magnitude of performance shortfalls relative to an aspiration level. We computed downside risk using five-year periods of annual firm ROA data. Computation involved a two-stage process. For each year t , we computed the downside performance discrepancy (δ_{jt}) as a function of the aspired-to target return (τ_{jt}) and the actual return for firm j (r_{jt}). The performance discrepancy takes on the value $\delta_{jt} = \tau_{jt} - r_{jt}$ if $\tau_{jt} > r_{jt}$. If $\tau_{jt} \leq r_{jt}$, then $\delta_{jt} = 0$. Next, we aggregated the five years of performance discrepancy values using the functional form of a root lower partial moment:

$$\text{RLPM}_\alpha(\tau; j) = [(1/5) \sum_{t=1}^5 \delta_{jt}^\alpha]^{1/\alpha}. \quad (3)$$

The parameter alpha reflects the relative importance of small and large deviations from the target. First-order ($\alpha = 1$) and second-order ($\alpha = 2$) root lower partial moments were calculated. Although the first- and second-order root lower partial moments were expected to be highly correlated, both measures were generated in order to evaluate the sensitivity of corporate downside risk to the choice of the parameter alpha. For the interested reader, Appendix A contains further background on the specification of downside risk measures as lower partial moments.

To accommodate alternative assumptions about the evolution of firms' target performance levels over time, we adopted four alternative assumptions: (1) firms update their target levels annually and set them equal to their own

performance in the previous year; (2) firms update their target levels annually and set them equal to the average performance in their two-digit SIC industries in the previous year; (3) firms base their target levels for any five-year period on the average performance of all firms in their two-digit SIC industries in the previous five-year period; and (4) firms are loss-averse and thus maintain a constant target return of zero. A target level corresponding to lagged industry average performance (assumptions 2 and 3 above) is consistent with theoretical discussions of adaptive aspirations (Cyert & March, 1963: 123). Such a target level consists of weighted sum of own-firm past performance and the past performance of other industry participants, a relevant reference group for determining a firm's target level. By contrast, assumption 1 allows for the possibility that firms look only to their own past performance in setting aspirations. Under assumption 4, firms' aspirations do not evolve over time. Rather, firms consistently aspire to avoid financial losses.

The use of first- and second-order root lower partial moments and four alternative assumptions about target levels generated a total of eight RLPM measures. Initial correlations indicated that the choice for the scaling parameter of alpha equals 1 or alpha equals 2 did not have a significant effect on the value of the downside risk measures. Risk measures differing only in this scaling parameter were significantly correlated at the .001 level, with a correlation coefficient greater than .96 in all four periods studied. Because of this very high correlation and for consistency in comparing results with those based on standard deviation risk measures, which are of order two, we retained only the (four) second-order root lower partial moments for our remaining analyses. In Table 1, we refer to the downside risk measure calculated using a firm's own previous year returns as the target level as RLPM(previous year target). RLPM(industry target) refers to the downside risk measure using previous year industry performance (which includes own-firm performance) as the target level. RLPM(fixed target) designates the downside measure with the target level in each period fixed at the industry average performance in the previous five-year period. Finally, the measure incorporating the assumption of loss aversion ($\tau_f = 0$) is labeled RLPM (zero target).

For comparing downside measures with the risk measures commonly used in strategy research, two returns variability measures were generated. The first of these was the common standard deviation of return on assets over a five-year period. The second measure was similar to the standard-deviation-around-returns trend used by Fisher and Hall (1965) and Oviatt and Bauerschmidt (1991). Appendix B contains computational details for the trend standard deviation and responds to concerns regarding variability measures expressed by Ruefli (1990, 1991) and Ruefli and Wiggins (1994).

Five years of returns data were required to calculate the four downside risk and two standard deviation measures of risk. Firms with fewer than five return observations were eliminated from the data set for that period.

Furthermore, the RLPM(fixed target) measure could not be generated in the first period (1972–76) since the required five years of lagged performance data were unavailable.

Slack. Bourgeois (1981) and Sharfman and colleagues (1988) provided conceptual treatments of slack. Bourgeois and Singh (1983) specified eight measures of organizational slack. They differentiated measures of available, recoverable, and potential slack. Singh (1986), Hambrick and D'Aveni (1988), and Bromiley (1991b) used accounting-based slack measures similar to those suggested by Bourgeois and Singh. We identified 13 distinct accounting-based slack measures from previous research.

There is theoretical support for the relevance of reference levels in specifying slack indicators, a concern that is not reflected in the operational measures of slack used in previous research. Bourgeois (1981) contended that changes in the amount of organizational slack over time, rather than absolute levels of slack, are relevant to explaining firm behavior. Similarly, March and Shapira (1987) and Bromiley (1991b) argued the influence of slack on performance and risk depends not on the absolute level of slack but on slack relative to a target level.

Financial ratios such as those commonly used as slack indicators differ across industries. Ratios that are the norm in one industry may be exceptionally high or low in another. Hence, slack measures may not generalize across industries. According to Lev (1969), average industry financial ratios offer reasonable proxies for target levels. We measured slack as the ratio of a firm's own accounting measure to its industry average (at the two-digit SIC level). Following Bourgeois and Singh (1983), we measured recoverable slack using the following ratios: accounts receivable/sales, inventory/sales, and selling, general, and administrative expenses/sales. In each case, our normalized measures consisted of a firm's ratio divided by the two-digit SIC industry average ratio.

Bourgeois and Singh also identified measures of both available and potential slack. We chose to focus on recoverable slack, for two reasons. First, recoverable slack is the most relevant concept of slack for many organizational stakeholders. The levels of accounts receivable to sales and of inventory to sales are directly relevant to a firm's capability to meet customer demands. The level of overhead expenses affects employee satisfaction through nonpecuniary benefits. Because of the immediate impact of recoverable slack on operations, constraints on recoverable slack are likely to be more salient to managers than constraints on potential or available slack.

Second, exploratory factor analysis indicated the available and potential slack measures found in previous research did not load on two distinct and consistent factors over the years included in the data set. Using the available and potential slack ratios normalized by their respective industry averages did not improve the stability of the factor loadings. By contrast, the three normalized recoverable slack indicators did load on a single factor with a great deal of consistency over 20 years of annual data. This finding supports

the use of the three recoverable slack measures as indicators of a common construct but also calls into question the reliability of the available and potential slack measures found in previous research.

The aggregate recoverable slack measures for a given year consisted of an unweighted sum of the three standardized recoverable slack indicators. The slack measure used for model estimation was a firm's mean recoverable slack calculated over a five-year period.

Sample. The sample consisted of all manufacturing firms in SIC codes 3000 to 3999 for which the necessary accounting data were available in the COMPUSTAT primary, secondary, and tertiary files during the years 1971 through 1991.⁹ We defined four periods corresponding to the five-year time segments of 1972–76, 1977–81, 1982–86, and 1987–91. Firms with returns or any recoverable slack indicator beyond three standard deviations from the annual mean across all firms were considered outliers and eliminated from that year's data set. We included 1971 data solely for the purpose of calculating the 1972 target return level, assuming that firms set the target level to the industry mean performance in the previous year. The sample provided at least ten firms for each two-digit SIC industry in each year.

RESULTS

Table 1 presents descriptive statistics and cross-sectional correlations between return, the various risk measures, slack, and the control variables for each of the four periods. Industry return, industry standard deviation, and industry downside risk denote the average ROA, standard deviation of ROA, and RLPM(industry target) for all firms in the same two-digit SIC industry (excluding the firm under observation). These three industry average variables serve as controls in the regression models.

Table 1 indicates significant negative correlations between all six risk indicators (four RLPM and two standard deviation measures) and five-year mean ROA.¹⁰ The two standard deviation measures had positive correlations of at least .87 across the four time periods. The RLPM using one-year lagged own-firm performance as the aspiration level, RLPM(previous year target), was unique among the four downside measures in being more highly correlated with the variance measures (standard deviation and trend standard deviation) than with the other RLPM measures in each period. The other three RLPM measures [RLPM(industry target), RLPM(fixed target), and RLPM(zero target)] maintained significant positive correlations of at least .78 in each period. Hence, with the exception of the assumption of annual updating of

⁹ The focus on manufacturing firms in SIC codes 3000–3999 corresponds with Bromiley's (1991b) sample selection. We concur with Bromiley's observation that focusing on manufacturing firms mitigates discrepancies in the data resulting from differences in accounting practices across single-digit SIC categories.

¹⁰ Collins and Ruefli's (1992) study of the airlines industry also found a negative relation between ordinal downside risk in a five-year period and ROA rank position in the fifth year of the period.

targets based solely on own-firm past performance, the RLPM measure appears robust to a range of target-level assumptions.

Given the consistently high correlations among three of the four RLPM measures and between the two standard deviation measures, we retained just two measures for the regression analyses. These were the second-order RLPM with aspirations updated annually based on industry performance [RLPM(industry target)] and the standard deviation of returns. Using these two measures allowed us to make direct comparisons between the risk-return relations obtained using the common standard deviation measure and those obtained using the previously untested RLPM measure. The RLPM(industry target) measure was chosen over the RLPM(fixed target) and RLPM(zero target) measures because of two appealing characteristics: (1) the assumption of annual updating of aspirations is consistent with the planning cycle of many organizations, and (2) incorporating both past own-firm and industry competitors' performance in the aspiration level is consistent with previous theoretical treatments of adaptive aspirations (Cyert & March, 1963; Herriott, Levinthal, & March, 1985). In the remainder of this article, we refer to RLPM(industry target) as simply "downside risk."

Initial regression results for Equations 1 and 2 indicated outlier observations may have unduly influenced the estimated coefficients. Outliers were eliminated if their influence statistics, DFFITS, indicated very influential observations.¹¹ Elimination of outliers resulted in deletion of 6.3 to 8.9 percent of the original sample observations in each of the 12 estimated regression models. A comparison of the regression results before and after elimination of outliers indicated no substantive differences in the signs or magnitudes of the estimated coefficients.

Tables 2 and 3 present ordinary-least-squares results (after elimination of outliers) for the return and risk regression equations, respectively. The first section of each table presents the downside risk results and the second section shows the standard deviation results. The column headings indicate the period of the dependent variable. The left-hand column of each period reports the estimated coefficients and their standard errors (in parentheses). Significance levels are not indicated for the direct effects of variables that also appear in interaction terms to avoid unwarranted interpretation of the coefficients of these variables.¹² The appropriate test for the significance of the combined effect of a variable both through the direct effect and the interaction term is an *F*-test (Kmenta, 1986). The *F*-statistic tests the hypothe-

¹¹ The DFFITS statistic is a scaled measure of the change in the predicted value for a given observation with and without including the observation in the model estimation. Large DFFITS values indicate very influential observations. Observations are thought to unduly affect model estimations when their DFFITS value exceeds $2\sqrt{p/n}$, where *p* is the number of parameters in a model and *n* is the number of observations (Belsley, Kuh, & Welsch, 1980).

¹² Although *t*-values for the interaction terms are meaningful (i.e., they are equivalent to a hierarchical *F*-test), the *t*-values for the two direct effect terms included in an interaction are not invariant to linear transformations of the variables (Cohen, 1978).

TABLE 1
Descriptive Statistics and Correlations by Period^a

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10
Period 1: 1972-76												
1. Return	0.067	0.040										
2. Standard deviation	0.026	0.021	-.20***									
3. Trend standard deviation	0.027	0.019	-.21***	.94***								
4. RLPM(previous year target)	0.019	0.017	-.18**	.81***	.78***							
5. RLPM(industry target)	0.021	0.026	-.77***	.64***	.61***	.58***						
6. RLPM(fixed target)												
7. RLPM(zero target)	0.005	0.015	-.51***	.71***	.69***	.64***	.85***					
8. Industry return	0.065	0.007	.16**	-.04	-.03	-.06	-.06	-.06				
9. Industry standard deviation	0.026	0.004	-.01	.23***	.23***	.20***	.18**		.21***	-.08		
10. Industry downside risk	0.020	0.005	-.03	.21***	.21***	.21***	.21***	.20***	.20***	-.22***	.88***	
11. Slack	0.000	2.134	-.15**	-.06	-.04	-.08	.06		.02	-.07	-.01	.00
Period 2: 1977-81												
1. Return	0.075	0.038										
2. Standard deviation	0.026	0.022	-.23***									
3. Trend standard deviation	0.028	0.019	-.17***	.87***								
4. RLPM(previous year target)	0.022	0.020	-.27***	.83***	.74***							
5. RLPM(industry target)	0.023	0.026	-.78***	.67***	.58***	.66***						
6. RLPM(fixed target)	0.019	0.024	-.74***	.71***	.61***	.68***	.98***					
7. RLPM(zero target)	0.004	0.013	-.47***	.75***	.70***	.67***	.78***	.83***				
8. Industry return	0.073	0.008	.21***	-.08	-.05	-.02	-.03	-.09†	-.16**			
9. Industry standard deviation	0.026	0.004	-.07	.21***	.19***	.19***	.11*	.13*	.17***	-.31***		
10. Industry downside risk	0.023	0.003	-.06	.20***	.17***	.19***	.11*	.12*	.17***	-.24***	.95***	
11. Slack	0.000	2.165	-.01	-.06	-.01	-.06	-.05	-.07	-.06	.00	.09†	.09†

TABLE 1 (continued)

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10
Period 3: 1982-86												
1. Return	0.045	0.056										
2. Standard deviation	0.046	0.047	-.55***									
3. Trend standard deviation	0.044	0.041	-.58***	.96***								
4. RLPm(previous year target)	0.042	0.042	-.64***	.92***	.91***							
5. RLPm(industry target)	0.041	0.055	-.85***	.87***	.87***	.87***						
6. RLPm(fixed target)	0.054	0.061	-.89***	.84***	.85***	.87***	.98***					
7. RLPm(zero target)	0.023	0.048	-.77***	.90***	.89***	.90***	.97***	.95***				
8. Industry return	0.044	0.016	.29***	-.09†	-.13**	-.19***	-.15***	-.23***	-.19***			
9. Industry standard deviation	0.045	0.011	-.11**	.25***	.25***	.25***	.23***	.25***	.24***	-.38***		
10. Industry downside risk	0.040	0.013	-.18***	.23***	.24***	.26***	.25***	.28***	.26***	-.61***	.92***	
11. Slack	0.000	2.152	-.14**	.01	-.00	.06	.11*	.08†	.09†	.04	-.16**	-.15**
Period 4: 1987-91												
1. Return	0.035	0.055										
2. Standard deviation	0.051	0.044	-.56***									
3. Trend standard deviation	0.042	0.036	-.52***	.92***								
4. RLPm(previous year target)	0.041	0.044	-.57***	.91***	.87***							
5. RLPm(industry target)	0.042	0.052	-.85***	.86***	.79***	.83***						
6. RLPm(fixed target)	0.045	0.053	-.86***	.84***	.77***	.81***	.98***					
7. RLPm(zero target)	0.028	0.046	-.80***	.88***	.81***	.84***	.98***	.97***				
8. Industry return	0.034	0.011	.21***	-.16***	-.18***	-.16***	-.12***	-.15**	-.20***			
9. Industry standard deviation	0.049	0.010	-.16***	.21***	.25***	.21***	.15**	.11*	.21***	-.78***		
10. Industry downside risk	0.041	0.009	-.16***	.21***	.24***	.21***	.16***	.14***	.21***	-.80***	.97***	
11. Slack	0.000	2.116	-.09†	.01	.03	.06	.07	.05	.06	-.03	.07	.06

* Sample sizes are as follows: period 1, 295; period 2, 385; period 3, 406; period 4, 445.

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

TABLE 2
Results of Regression Analyses for Return^a

Variables	1977-81		1982-86		1987-91	
	Parameter Estimate	F	Parameter Estimate	F	Parameter Estimate	F
Return, as a function of downside risk _{t-1}						
Intercept	-.021 (.014)		-.046*** (.010)		-.023* (.009)	
Return _{t-1}	.483*** (.063)		.702*** (.076)		.672*** (.078)	
Downside risk _{t-1}	.193 (.088)	9.407***	.193 (.117)	3.548*	.314 (.085)	7.621***
Slack _{t-1}	.001 (.001)	7.141***	-.001 (.001)	2.949†	-.000 (.001)	2.441†
Downside risk _{t-1} × slack _{t-1}	.062** (.021)		.050† (.026)		.039* (.018)	
Industry return _t	.831*** (.198)		.875*** (.122)		.547** (.194)	
R ²	.266		.382		.271	
Regression F	25.310***		45.029***		30.529***	
N	355		370		417	

TABLE 2 (continued)

Variables	1977-81		1982-86		1987-91	
	Parameter Estimate	F	Parameter Estimate	F	Parameter Estimate	F
Return _t as a function of standard deviation $t-1$						
Intercept	-.021 (.014)		-.032*** (.008)		-.011 (.008)	
Return _{t-1}	.395*** (.040)		.617*** (.050)		.505*** (.047)	
Standard deviation _{t-1}	.117 (.059)	5.593**	.075 (.094)	0.667	.165 (.065)	3.735*
Slack _{t-1}	.002 (.001)	7.004***	-.001 (.001)	1.536	-.001 (.001)	1.383
Standard deviation _{t-1} × slack _{t-1}	.050** (.019)		.024 (.028)		.026 (.018)	
Industry return _t	.917*** (.195)		.777*** (.127)		.558** (.192)	
R^2	.275		.365		.284	
Regression F	26.502***		42.130***		31.949***	
N	355		373		409	

^a Standard errors are in parentheses.

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

TABLE 3
Results of Regression Analyses for Risk^a

Variables	1977-81		1982-86		1987-91	
	Parameter Estimate	F	Parameter Estimate	F	Parameter Estimate	F
Downside risk, as a function of return _{t-1}						
Intercept	.021* (.009)		.029*** (.008)		.027** (.010)	
Downside risk _{t-1}	.144* (.059)		.220* (.102)		.090 (.069)	
Return _{t-1}	-.125 (.038)	5.291**	-.250 (.064)	8.537***	-.242 (.065)	8.068***
Slack _{t-1}	-.001 (.000)	3.919*	.001 (.001)	1.499	-.000 (.001)	0.828
Return _{t-1} × slack _{t-1}	-.003 (.007)		-.012 (.009)		.014 (.011)	
Industry downside risk _t	.162 (.350)		.411** (.126)		.355† (.207)	
R ²	.173		.198		.194	
Regression F	14.655***		18.248***		19.390***	
N	357		375		409	

TABLE 3 (continued)

Variables	1977-81		1982-86		1987-91	
	Parameter Estimate	F	Parameter Estimate	F	Parameter Estimate	F
Standard deviation, as a function of return_{t-1}						
Intercept	.013* (.005)		.016* (.007)		.016† (.009)	
Standard deviation $_{t-1}$.108** (.039)		.552*** (.067)		.228*** (.048)	
Return $_{t-1}$	-.056 (.021)	4.074*	-.082 (.036)	2.980†	-.090 (.038)	2.865†
Slack $_{t-1}$	-.000 (.000)	0.240	-.000 (.001)	0.767	-.001 (.001)	0.579
Return $_{t-1} \times \text{slack}_{t-1}$.003 (.005)		-.009 (.008)		-.001 (.010)	
Industry standard deviation $_t$.404* (.185)		.325* (.135)		.466** (.169)	
R^2	.080		.205		.158	
Regression F	6.019***		18.865***		15.359***	
N	352		372		414	

^a Standard errors are in parentheses.

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

sis that the coefficients of the direct effect and the corresponding interaction are jointly zero. The second column of each period's regression results reports *F*-statistics for terms included in interactions and their significance levels.

The significant correlations among the independent variables evident in Table 1 motivated assessment of potential collinearity problems. Examinations of both the variance inflation factors and conditioning index statistics provided diagnostics well below the suggested guidelines, indicating collinearity did not present serious problems for model estimation.¹³

Hypothesis 1 states that downside risk should have a positive relation with subsequent financial performance. The *F*-statistics for downside risk are significant in each period. Furthermore, the signs of both the direct and moderated effects of downside risk are positive, supporting Hypothesis 1. A firm that takes downside risks tends to improve its performance in the subsequent period. Contradicting the negative risk-return relations supported by some previous research using variability measures of risk, we found that downside risk is rewarded with higher subsequent performance.

Hypothesis 3 states that the downside risk-by-slack interaction term would be negatively related to subsequent performance. The significant, positive coefficients on the interactions between downside risk and slack contradict this hypothesis. Rather than making firms sluggish in responding to downside risk, slack facilitates organizational responses, enhancing subsequent performance. Low-slack firms may be constrained in their ability to implement successful searches for new organizational strategies.

The *F*-statistics indicate that slack influenced return in the first period as expected but had a weaker ($p < .10$) effect in the later periods. The relative magnitudes of slack's moderating and direct effects indicate its primary role is moderating the relation of downside risk to return rather than directly affecting return.

The control variables, lagged return and contemporaneous industry return, have the expected significant, positive relations with return.

The second section of Table 2 provides mixed evidence regarding the relation between risk, as measured by returns standard deviation, and returns. Although the first and third periods reveal a significant positive relation, the standard deviation *F*-statistic was not significant in the second period. The relative weakness of the relation between standard deviation and returns

¹³ One approach to assessing collinearity is the calculation of variance inflation factors (VIFs). A VIF greater than 10 is often interpreted as an indication of collinearity problems (Neter, Wasserman, & Kutner, 1985: 392). However, if several near dependencies exist among explanatory variables, collinearity assessments based on large bivariate correlations or VIF factors may not provide adequate grounds for assessing collinearity. In these instances, conditioning indexes provide a supplemental collinearity diagnostic. Belsley and colleagues (1980) suggested that conditioning indexes in the neighborhood of 15 to 20 tend to result from an underlying near dependency and that indexes in excess of 100 cause substantial variance inflation and potential large distortions in regression coefficients. For the 12 regressions reported in Tables 2 and 3, the maximum VIF was 4.03. The maximum conditioning index was 3.81.

indicates downside risk is a more consistent predictor of subsequent financial performance than returns standard deviation. Whereas standard deviation identifies risk associated with the volatility of past returns, it fails to discriminate between upside and downside performance volatility. The results provide initial evidence that discrimination between downside and upside volatility is relevant to explaining subsequent performance.

The slack-by-standard deviation interaction was significant only in the 1977–81 period. This interaction was not significant in the final two periods for the standard deviation model. Unlike the results using the downside risk measure, the standard deviation results provide little empirical support for the behavioral proposition that slack moderates the relations between risk and return.

As in the downside risk equation, the two control variables, lagged return and contemporaneous industry return, are significant and have the expected positive signs. Moreover, the ability of the standard deviation model to explain return is largely due to the presence of these two control variables.

The results shown in Table 3 shed light on Hypotheses 2, 4, and 5. Hypothesis 2 states that financial performance should have a negative relation with subsequent downside risk. As the behavioral theory of the firm suggests, organizations performing well avoid the cost and uncertainty associated with searching for alternative strategies. The downside risk model provides strong support for this hypothesis in all three periods.

Hypotheses 4 and 5 proposed slack acts as a buffer allowing firms to reduce subsequent downside risk. Hypothesis 4 states that the combined effect of slack (both direct and moderating) is to reduce downside risk. The *F*-statistic for the combined effect of slack is significant in just the first of the three periods, where the slack effect has the expected negative sign. Hypothesis 4 was not supported in the other two periods. Hypothesis 5 states that slack enhances the negative effect of financial performance on downside risk. The insignificant coefficients for the interaction terms do not support this hypothesis.

Although contemporaneous industry and lagged own-firm downside risk had the expected positive signs, they were not significant in all periods. Contemporaneous industry risk has the expected significant, positive sign in the first two periods studied. Lagged downside risk was significant in the last two periods. These results support inclusion of both controls; however, the relative influences of lagged downside risk and contemporaneous industry downside risk differ across periods.

The standard deviation results shown in the second section of Table 3 present some interesting contrasts to the downside risk results. Return had a significant, negative effect at the .05 level only in 1977–81. The sign was also negative in the other two periods but significant at only the .10 level. Slack showed no significant effects in any of the periods in the standard deviation model. None of the return-by-slack interactions were significant.

The coefficient on the lagged standard deviation of returns was positive and significant in all three periods. This result indicates more consistent correlation across time for the standard deviation measure than for the down-

side measure. Contemporaneous industry risk, as measured by the average standard deviation across all other firms in an industry, also showed a significant, positive relation.

As with the results in the second section of Table 2, the standard deviation risk equations show consistent relations with the control variables but only weak relations with the substantive variables based on behavioral theory. This finding held both before and after elimination of outliers. Given the weak risk-return relations in the models incorporating the standard deviation measure, it is difficult to make generalizations regarding the behavioral theory relations summarized in the five hypotheses.

The positive relation of risk and subsequent return using the downside measure and the negative influence of return on risk are, however, consistent and significant across all periods. This pattern suggests an interesting sequence in agreement with the behavioral theory of the firm: taking downside risk results in higher performance, but higher performance leads to less risk taking. Thus, using downside risk, we have a self-correcting cycle that contrasts with the downward spiral hypothesized in previous research on Bowman's (1980) risk-return paradox. Research applying prospect theory has contended that poorly performing firms take bad risks and that worse performance results (Bowman, 1982; Fiegenbaum, 1990; Fiegenbaum & Thomas, 1988; Jegers, 1991). Such a downward spiral ultimately would result in the demise of a firm. Using downside risk, we did not find evidence that poor performers take "bad risks." On the contrary, we found that poor performers often take "good risks" and that the existence of slack resources may allow them to seek out even "better risks."

Tables 2 and 3 indicate that within each of the four sets of regression estimates, the signs of the significant coefficients were consistent across the three time periods. We conducted formal tests for stability of the regression parameters over the three periods using Chow tests (Kennedy, 1985: 87-88). These tests indicated that the coefficients for the four models were unstable over the three time periods. All *F*-statistics for the Chow tests were significant at the .01 level. Hence, although the signs of the significant model parameters were consistent within each of the four sets of regression analyses, the magnitude of the effects differed across periods.

DISCUSSION

Strategy researchers have given much attention in recent years to studying risk-return relations in corporate data. This study, however, is the first to elaborate a theoretical perspective on organizational downside risk grounded in behavioral theory. Research on managers' concepts of risk indicates managers conceptualize risk in terms of failure to achieve targets. This finding provides a compelling argument for shifting the focus of empirical strategy research from performance variability to downside risk.

Our tests of the behavioral model challenge a major contention of previous research based on prospect theory, namely, the idea that poor performers take on high variance strategies with low expected values. Such risk-seeking

behavior can be shown to increase the probability of firm survival despite reducing expected returns (Aron & Lazear, 1990; Singh, 1986). Using a fundamentally different concept of risk—downside risk—results in a very different pattern of risk-return relations. The evidence from this study indicates downside risk leads to organizational strategic changes that improve, rather than diminish, subsequent firm performance. Our results indicate that this relation is strengthened by the presence of slack resources. This finding contradicts the notion of a downward spiral in which poor performance increases risk taking, which further erodes subsequent performance.¹⁴

Nevertheless, firms with exceptionally high performance avoid downside risk in the subsequent period. Such downside risk avoidance does, in turn, drive down subsequent performance. Combining the results from the return and downside risk equations indicates a self-correcting, rather than downward spiraling, cycle involving performance and downside risk.

The regression results also shed light on the role of slack resources in determining organizational performance and downside risk. The empirical evidence indicates the primary role of slack is to facilitate organizational responses to downside risk, thus improving subsequent performance. By contrast, slack does not appear to play a role in determining organizational risk taking. These findings contradict the contention that slack acts as a buffer reducing organizational performance and risk taking.

This initial exploration of accounting-based downside risk measures indicated some attractive properties. First, RLPM downside risk measures proved quite robust to alternative assumptions about firm target levels (τ_{jt}) and order specification (i.e., values of the RLPM parameter alpha, an indicator of risk preference). Four different assumptions about the time path of firm performance targets and both first- and second-order moments resulted in eight alternative RLPM measures. Despite the specification differences, the eight measures were highly positively correlated in each of the time periods examined. Whereas the functional form of the RLPM (Equation 3) indicates

¹⁴ Since the standard deviation of returns and the standard deviation of stock analysts' earnings forecasts are significantly correlated (Miller & Bromiley, 1990), we would expect the accounting returns standard deviation results to be similar to those reported by Bromiley (1991b) using the forecast measure. Whereas the standard deviation results reported here indicate weak positive relations between risk and subsequent return, Bromiley found a negative effect of risk on return. Both studies find performance reduces subsequent risk. Differences in model specification, lag structure (one-year versus five-year lags), and estimation approach (cross-sectional versus pooled cross-sectional and time series data) may account for the divergent results. Bromiley's single-year lagged model produced results similar to the negative cross-sectional correlations between returns and standard deviation reported in Table 1.

Despite contradictory findings, both studies raise questions about whether substantive feedback loops exist in estimated risk-return relations using variability measures in behavioral models. As reported in Tables 2 and 3, the risk-return relations were not significant (at the .05 level) in three of the six standard deviation regressions. In assessing the substantive impact of risk-return feedbacks in the model, Bromiley concluded, "Thus, the relations of performance and risk do create a negative feedback loop, but it is of such small magnitude that other factors overwhelm it" (1991b: 54).

an entire class of measures, the results in Table 1 indicate little difference in the empirical properties of RLPM measures falling within the guidelines offered by existing theory for specifying target levels and the parameter alpha (Appendix A). The one exception to this general conclusion was the RLPM measure specifying the target level as the one-year lagged own-firm performance, which tended to be more highly correlated with the standard deviation measures than with the other downside measures.

Tests of the behavioral model indicated more consistently significant risk-return relations when downside risk was used than when the standard deviation of return was used. This result was evident before we eliminated outlier observations as well as after. With returns standard deviation as the risk proxy, the relations between risk and return were often not significant (at the .05 level). In contrast, downside risk exhibited a consistently significant, positive relation with subsequent performance (Table 2). Performance had a consistent, and highly significant, negative relation with subsequent downside risk (Table 3). Although the positive relation between downside risk and subsequent performance can be partially explained as regression toward the mean (Kenny, 1979: 21), the negative relation between performance and subsequent downside risk contradicts that explanation.

These observations should motivate broader interest in downside risk among empirical strategy researchers. Whereas strategy theorists and managers have indicated a propensity to think about risk in terms of downside outcomes, empirical strategy research has not previously incorporated downside measures based on the concept of lower partial moments. The initial results from this study encourage wider theoretical and empirical treatments of downside risk.

As a theory of organizational risk-return relations, the behavioral theory of the firm suffers from two important shortcomings. First, since behavioral theory seeks to explain risk as a managerial choice, it neglects unchosen risks. A more complete perspective on organizational risk would acknowledge that risks can occur that are environmentally determined and result in deviations from managers' risk preferences. This acknowledgment suggests the need for further research on downside risk incorporating organization-environment interactions. Such a perspective acknowledges that managers and environments jointly determine risk-return relations. Second, strategic actions mediate the relations between downside risk and performance from one period to the next. The behavioral theory of the firm, however, does not illuminate the content of these strategic actions. Explicit attention to the mediating strategic responses is essential to advancing research on organizational risk.

These two observations suggest downside risk measures have applications beyond the parsimonious behavioral model tested here. Most important, strategy and organization theorists need to break away from focusing on the indirect relation between risk and return to the exclusion of their managerial and environmental determinants. Although research on risk-return relations has revealed the measurement properties of alternative risk measures, it has done little to inform managerial decisions. The relations between firm strategy, industry structure, risk, and performance raised in

previous research (e.g., Aaker & Jacobson, 1987; Amit & Wernerfelt, 1990; Cool, Dierickx, & Jemison, 1989; Oviatt & Bauerschmidt, 1991; Woo, 1987) could be reanalyzed from a downside risk perspective.

Diversification and investments in research and development affect organizational risk (e.g., Hoskisson & Johnson, 1992). Recent theoretical developments in financial economics and strategy conceptualize such strategic moves as options (cf. Dixit & Pindyck, 1994; Sanchez, 1993). Like financial options, these investments provide the opportunity to take advantage of upside gains but avoid downside outcomes. Option theory offers a basis for explaining strategic investments under uncertainty when decision makers have an aversion to downside outcomes and, as such, may provide a fruitful direction for theory building.

Agency theory presents another domain for extending research on organizational downside risk. This article focused on the managerial perspective and emphasized firm-specific downside risk measures incorporating accounting returns, but shareholders may be more interested in the downside stock returns variability of a diversified portfolio (cf. Harlow, 1991). Hence, we might postulate that steps taken to address agency problems, such as changes in governance structures, monitoring, and management compensation systems, can result in managerial attention to maximizing shareholder returns rather than minimizing downside risk. For example, compensation based on employee stock ownership plans results in managers being exposed to both downside and upside stock price movements. By contrast, compensation through stock options provides the potential for unlimited gains while limiting downside risk. Hence, organizations using employee stock ownership plans may exhibit less downside risk than organizations providing stock options. Future research may shed light on the moderating effects of agency theory variables on managerial decisions affecting downside risk and return.

CONCLUSION

In this study, we questioned the conceptual validity of the variability measures of risk commonly used in strategy research and proposed downside risk as an alternative. Hypotheses based on the behavioral theory of the firm motivated a parsimonious model of downside risk-return relations. The empirical results contrasted models using root lower partial moments and the conventional standard deviation of returns as risk proxies. Risk measured as root lower partial moments demonstrated more consistent significant relations with return than did returns standard deviation.

Consistent with the behavioral theory of the firm, the results support a positive effect of downside risk on subsequent performance and a negative effect of performance on downside risk. This self-correcting cycle is an interesting contrast to the downward spiral proposed by previous risk-return research based on prospect theory. Rather than acting as a buffer, slack enhances the subsequent organizational performance of firms experiencing downside risk. Future research should shed light on the specific strategic actions that mediate risk-return relations.

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APPENDIX A

Stone (1973), Fishburn (1977), and Laughhunn, Payne, and Crum (1980) specified downside risk measures at the individual level as lower partial moments. We adapt their measures to organizations.

Consider the returns distribution for a given firm j . For a sample of n observations from this returns distribution, we can express downside risk in terms of the return observations (r_j), a target return, denoted τ , and the relative importance of returns below the target, measured by a parameter α . Downside risk for firm j is a function of below-target returns specified as a lower partial moment:

$$\text{LPM}_\alpha(\tau;j) = (1/n) \sum_{r_j < \tau} (\tau - r_j)^\alpha, \quad \alpha \geq 0. \quad (\text{A1})$$

The term lower partial moment (LPM) refers to the inclusion of only the left-hand (downside) tail of the returns distribution in the calculation. The value of the parameter α reflects the importance of small deviations below target relative to large deviations. If small deviations below target are unimportant relative to large deviations, the appropriate value for α would be greater than one. As the value of alpha approaches zero, small and large deviations below target are weighted more equally in assessing downside risk. Although α could take on any nonnegative value, for $\alpha = 0$ LPM $_\alpha$ reduces to the probability of loss, whereas $\alpha = 1$ and $\alpha = 2$ imply expected target shortfall and target semivariance concepts of risk, respectively.

Stone (1973) offered a variant of the LPM risk measure, the root lower partial moment (RLPM $_\alpha[\tau;j]$), defined as the α -order root of LPM $_\alpha(\tau;j)$:

$$\text{RLPM}_\alpha(\tau;j) = \text{LPM}_\alpha(\tau;j)^{1/\alpha} = [(1/n) \sum_{r_j < \tau} (\tau - r_j)^\alpha]^{1/\alpha}, \quad \alpha > 0. \quad (\text{A2})$$

For $\alpha = 2$, this measure is termed "target semideviation" (Harlow, 1991). As Stone pointed out, RLPM $_\alpha(\tau;j)$ is linearly homogeneous (that is, homogeneous of degree one). Linear homogeneity indicates proportional changes in the aspiration level and returns change RLPM $_\alpha(\tau;j)$ by an equivalent proportion. By contrast, LPM measures are not homogeneous of degree one when $\alpha \neq 1$. This study specified downside risk measures as root lower partial moments because of their desirable property of being homogeneous of degree one.

Only under very restrictive conditions will estimated risk-return relations using downside measures be proportional to risk-return relations using central moments. Consider, for example, the common standard deviation measure of risk (the second-order root central moment). Estimated risk-return relations using returns standard deviation and the second-order RLPM measures are proportional only if (1) the mean return for each firm is chosen as the target level and (2) returns are symmetrically distributed about the mean. Under these conditions, returns standard deviation is equal to two times the second-order RLPM measure. If, however, some target level other than the mean return is chosen or the return distribution is skewed, or both, the downside and standard deviation measures will yield different risk-return relations. This discrepancy between the standard deviation and second-order RLPM measures motivates the comparisons between these two measures presented in the empirical portion of this study.

Computing the RLPM measure used in this study required choosing an appropriate aspiration target level. The LPM measures specified by Fishburn (1977) and Stone (1973) assumed a fixed target level for determining downside deviations. This assumption is inconsistent with previous research on the evolution of organizational aspirations. Cyert and March (1963), Levinthal and March (1981), and Herriott, Levinthal, and March (1985) portrayed organizational aspirations as evolving over time. Subsequent studies by March (1988b) and March and Shapira (1987) indicated organizational aspirations change with experience. In order to accommodate adaptive aspirations, we specified downside risk as a function of a time-specific target level (τ_j). Doing so gave rise to the RLPM specification indicated as Equation 3 in the text.

APPENDIX B

Apart from the lower partial moment measures, two variability measures of risk were also computed. These were the common standard deviation of returns and a measure of the variability of a firm's returns around its time trend, each computed using five years of firm returns (ROA) data. Fisher and Hall (1969) and Oviatt and Bauerschmidt (1991) presented the measure:

$$\text{Trend standard deviation} = [(1/n) \sum_{t=1}^n (r_{jt} - r'_{jt})^2]^{1/2}, \quad (\text{B1})$$

where r_{jt} and r'_{jt} are the actual and the predicted return to firm j in year t , respectively. For our calculations, predicted returns, r'_{jt} , were estimated by the autoregressive time series model $r'_{jt} = b_{0j} + b_{1j}t + u_{jt}$, where t is the year, and u_{jt} assumes a first-order autocorrelation of errors, i.e., $u_{jt} = e_{jt} - a_1 u_{j,t-1}$. Rather than using n as the divisor in Equation B1, we used $n - 2$, which results in an unbiased estimator of the variance of the error term, u_{jt} (Neter et al., 1985: 110).

Ruefli and Wiggins (1994) criticized the measure used by Oviatt and Bauerschmidt (1991) on the grounds that if the trend line in a firm's returns is relatively flat, the measure is effectively equivalent to the returns standard deviation. This potential for convergence between trend and familiar standard deviations is problematic if we accept Ruefli's (1990, 1991) concerns about the appropriateness of estimating risk-return relations using contemporaneous means and variances (or standard deviations) generated from firm returns data. It should be noted that this criticism is not directly applicable to this study since we estimated lagged rather than contemporaneous mean-standard deviation relations. Nevertheless, we believe this criticism has unnecessarily deterred researchers from using the standard deviation measure and, as such, warrants response.

Although it can be shown that the sample mean and sample variance are independent for a particular normal distribution (cf. DeGroot, 1975: 326–333), it does not follow that the sample means and sample variances are unrelated across different firms in cross-sectional research (Bromiley, 1991a). The treatment of heteroskedasticity in econometric research provides a basis for the validity of estimating mean-variance relations. One common form of heteroskedasticity, termed dependent variable heteroskedasticity, involves the assumption that the variance of the disturbance is proportional to the squared mean of the dependent variable (Kmenta, 1986: 287). That is, for the simple regression model $Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i$, we specify $\varepsilon_i \sim N(0, \sigma_i^2)$, where $\sigma_i^2 = \sigma^2 [E(Y_i)]^2$, or equivalently, $\sigma_i = \sigma [E(Y_i)]$. Thus, this form of heteroskedasticity assumes a simple linear relation between the standard deviation of the error term and the expected value of Y_i , with an unknown but estimable parameter σ . In other words, for any subset of observations with expected value $[E(Y_i)]$, the standard deviation of the error term is directly proportional to the expected value. Since σ_i (the standard deviation of ε_i) is, by definition, the standard deviation for the subset of dependent variable observations with expected value $[E(Y_i)]$, we see that this common form of heteroskedasticity implies a direct relation between mean and standard deviation across subsets of normally distributed data with different means. Hence, there is a precedent in econometric research for the estimation of standard deviation-mean relations as found in many strategy studies of risk-return relations.

Estimating mean-standard deviation relations in returns data across firms simply involves postulating a theoretical relation of the form $\sigma_j = \beta \mu_j + v_j$, where σ_j is the standard deviation of the returns for firm j , μ_j is the mean return, v_j is the normally distributed error term with mean zero and constant variance, and β is the parameter to be estimated. A sample mean and standard deviation can be computed from multiple observations for each firm. For any firm j , the sample mean and standard deviation are unbiased estimators of μ_j and σ_j , respectively. Hence, ordinary-least-squares regression generates an unbiased estimate of β . We agree with Ruefli (1990) that in order to estimate the relations between sample mean returns and the standard deviations of returns the relation must be stable over the data collection period. As Bromiley (1991a) pointed out, this is a fundamental assumption necessary for model identification in general and is not unique to mean-variance relations.

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DISTINGUISHING THE EFFECTS OF FUNCTIONAL AND DYSFUNCTIONAL CONFLICT ON STRATEGIC DECISION MAKING: RESOLVING A PARADOX FOR TOP MANAGEMENT TEAMS

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Top management teams make strategic decisions, and the products of their decision making influence organizational performance. However, a subtle paradox is embedded in this relationship. This study focuses on conflict as the crux of this paradox and provides evidence from two different samples of conflict's consistent yet contradictory effects on decision quality, consensus, and affective acceptance.

Top management teams make strategic decisions, the quality of which influences organizational performance. Because consensus among team members facilitates the implementation of those decisions, consensus also influences organizational performance. Further, to sustain their ability to produce and implement strategic decisions, top management teams must maintain positive affective relationships among their members. Thus, decision quality, consensus, and affective acceptance are, together, all necessary for sustainable high performance.

However, questions have arisen as to whether these by-products of strategic decision making can be attained simultaneously (Eisenhardt & Zbaracki, 1992). Some, for instance, have suggested that decision quality, consensus, and affective acceptance cannot peacefully coexist (Schweiger & Sandberg, 1991). Conflict is the crux of this conundrum. Indeed, Schweiger, Sandberg, and Ragan stated that "on the one hand, conflict improves decision quality; on the other, it may weaken the ability of the group to work together" (1986: 67). This study examines the paradoxical effects of conflict on strategic decision making and answers the question, how can top management teams use conflict to enhance the quality of their decisions, without sacrificing consensus and affective acceptance among their members?

THEORETICAL BACKGROUND

Decision Quality

Strategic decisions address complex and ambiguous issues that involve large amounts of organizational resources (Mason & Mitroff, 1981). Thus, it

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is not surprising that strategic decision making has been so heavily researched. One stream of this research, focusing on the quality of the decisions themselves, has identified two principal antecedents of decision quality: the cognitive capabilities of a top management team and the interaction process through which the team produces its decisions.

Researchers have held for some time that a team's cognitive capability is related to its cognitive diversity. Diversity provides an assorted stock of capabilities upon which a team can draw when making complex decisions (Hoffman, 1959; Hoffman, Harburg, & Maier, 1962; Hoffman & Maier, 1961; Wanous & Youtz, 1986). Bantel and Jackson, for instance, argued that "when solving complex, non-routine problems, groups are more effective when composed of individuals having a variety of skills, knowledges, abilities and perspectives" (1989: 109). The evidence supports this argument. Bantel and Jackson (1989) and Murray (1989) each found that top management teams with diverse capabilities made more innovative, higher-quality decisions than teams with less diverse capabilities.

In addition to cognitive capability, and of at least equal importance, is the interaction process teams use to produce their decisions. Because each strategic decision represents a unique combination of the diverse skills, knowledges, abilities, and perspectives described by Bantel and Jackson (1989), decision quality also "depends heavily upon the process that the group actually employs" (Steiner, 1972: 35).

Effectively utilizing a team's capabilities involves identifying and synthesizing those skills and perspectives most appropriate for each decision (Schweiger & Sandberg, 1989). Research has shown that dialectically styled interaction techniques promote this process and provide a means to synthesize conflicting alternatives into a single decision. The principle underlying dialectically styled interaction is that rigorous debate of different and opposing positions produces a synthesis that is qualitatively superior to either of the initial positions themselves (Churchman, 1971). A great deal of research has accumulated on techniques like devil's advocacy (DA) and dialectical inquiry (DI), which encourage critical and investigative interaction designed to produce a single decision from a variety of diverse perspectives (Cosier, 1978; Schweiger, Sandberg, & Ragan, 1986; Schwenk, 1990; Schwenk & Cosier, 1980). Although different in their procedural details, these techniques help teams identify and evaluate the assumptions underlying and surrounding a given issue. The evidence strongly supports the contention that teams that utilize some form of dialectical interaction, like DI (Mason, 1969) or DA (Cosier, 1978), produce higher-quality decisions than teams that do not (Schweiger, Sandberg, & Rechner, 1989; Schwenk, 1989).

So, the research on strategic decision quality seems to suggest that although cognitive diversity represents the potential for high-quality decisions, that potential is best realized through critical and investigative interaction processes in which team members identify, extract, and synthesize their perspectives to produce a decision.

Consensus

As important as they are, high-quality decisions mean little if they cannot be implemented, and successful implementation requires the participation of a company's top management team. Indeed, Child stated that "the implementation of decisions reached depends upon securing the cooperation of other parties to the decision" (1972: 14). Thus, many have argued that decision processes promoting consensus among team members are more likely to enhance organizational performance than decision processes that do not promote consensus (Bourgeois, 1980; Dess, 1987; Dess & Origer, 1987; Guth & MacMillan, 1986).

To facilitate a decision's implementation, however, consensus must be more than simple agreement. As Child (1972) noted, the effective implementation of a strategic decision requires the active cooperation of the team members. This active cooperation is important because strategic decisions are rarely articulated in full detail (Mason & Mitroff, 1981; Mintzberg, Raisinghani, & Theoret, 1976). Numerous complications can arise as the implementation unfolds and as the details of the decision are ironed out. These issues must be addressed individually but in a manner that is consistent with the decision's overall intent. To effectively usher a decision through this complex web of operational details, team members must do much more than simply agree to or comply with the decision. They must both understand and commit to the decision if it is to be implemented effectively (Wooldrige & Floyd, 1989, 1990). Those understandings and commitments are cultivated while the decision is being made.

Understanding is important because it provides common direction for team members. A common understanding of the rationale underlying a decision will give the individual team members the ability to act independently but in a way that is consistent with the actions of others and consistent with the spirit of the decision. Commitment is also important because it reduces the likelihood that a particular decision will become the target of cynicism or countereffort (Guth & MacMillan, 1986). Implementing a strategic decision takes time and may involve overcoming some resistance or opposition (Allison, 1971; Mason & Mitroff, 1981; Mintzberg et al., 1976). Thus, it is important that the members of the management team be committed to the decision and to its successful implementation.

Each decision process must build consensus among team members, because without understanding and commitment successful implementation of the decision is unlikely. By itself, however, consensus does nothing to ensure decision quality. Thus, for improved performance, teams must cultivate both quality and consensus on every decision.

Affective Acceptance

Decision quality and consensus are characteristics of individual decisions. Top management teams, however, make many strategic decisions. As Hurst, Rush, and White stated, "The long term maintenance/existence of the

business requires the ongoing (re)creation of the business and the logic by which it is managed" (1989: 88). Thus, although quality and consensus are important for each decision, to be successful over time top management teams must produce quality and consensus on every decision.

To do this, team members must maintain affective relationships that allow them to work together effectively. Team members with strong negative sentiments toward one another or toward the team in general are less likely to participate fully in the decision-making process. Their nonparticipation and general negativity can adversely affect both current and future decisions. Thus, forces that undermine affective acceptance will, in the long run, hinder performance.

To summarize, by combining their diverse cognitive capabilities with some sort of interaction process, top management teams make strategic decisions. Decision quality, consensus, and affective acceptance are by-products of those decisions and together are all equally necessary for sustainable high organizational performance.

The Paradox of Strategic Decision Making

Although necessary for high performance, decision quality, consensus, and affective acceptance are not completely complementary. Indeed, the antecedents of decision quality—diversity and interaction—may actually hinder the development of consensus and the maintenance of affect. Likewise, the pursuit of consensus or affective acceptance may well reduce decision quality. The result is a paradox (Gaenslen, 1980; Slatte, 1968). Decision quality, consensus, and affective acceptance are, together, necessary for high performance. Yet, in many ways decision quality, consensus, and affective acceptance are contradictory (Amason & Schweiger, 1994).

To illustrate, consider a cognitively diverse team critically investigating an important issue. Because of their diversity, the members of this team will each see the issue differently (Allison, 1971; Mitroff, 1982b). Bringing these differences into close contradistinction will accentuate the underlying dissimilarities and likely provoke some acrimony. Acrimony, however, attenuates consensus (Guth & MacMillan, 1986; Priem, 1990). Researchers have found that many of the conflict-inducing techniques that improve decision quality also reduce consensus and lower affective acceptance (Schweiger et al., 1986; Schwenk, 1990). Thus, the benefits of a high-quality decision can be lost if the team lacks the understanding or commitment needed to implement the decision or the will to work together on other decisions in the future.

However, attempts to minimize underlying dissimilarities will reduce the quality of the decision. Although teams that lack diversity experience less contentiousness than more diverse teams, the absence of diversity will mean fewer capabilities and less potential for high-quality decisions (Bantel & Jackson, 1989; Hoffman & Maier, 1961; Priem, 1990). Similarly, interaction processes designed to minimize confrontation may increase consensus and affective acceptance but lower decision quality by encouraging teams to pur-

sue only those alternatives that can be readily agreed upon (Janis, 1982; Schweiger et al., 1986).

For example, the nominal group (NG) technique promotes affective acceptance by restricting conflict (Van de Ven & Delbecq, 1974). The NG technique does not permit direct confrontation and produces decisions through a vote rather than through reconciliation of the differences. By removing contention from the process, the technique tends to improve affective acceptance. However, it also tends to lower the potential for high-quality decisions. As Frankel observed, the technique does "not provide a mechanism for developing synergistic solutions" (1987: 547). Hegedus and Rasmussen also noted that the technique encourages teams to "resolve differences by averaging rankings without logically resolving the divergent rationales" (1986: 547). Without conflict among diverse perspectives, no synthesis occurs, and decision quality suffers.

Conflict in Strategic Decision Making

As stated before, conflict is the crux of this paradox. Although acknowledged as important by most theorists (Cosier & Schwenk, 1990; Hickson, Butler, Cray, Mallory, & Wilson, 1986; Janis, 1982; Mintzberg et al., 1976; Schweiger et al., 1986), conflict is not yet well understood (Eisenhardt & Zbaracki, 1992). Conflict appears to be important for high-quality decisions. Yet, conflict also appears to be an impediment to consensus and affective acceptance.

Research has shown conflict to be multidimensional (Jehn, 1992; Pinsky, 1990; Pondy, 1969; Rahim, 1983; Wall & Nolan, 1987). Thus, it is possible that one dimension of conflict enhances decision quality while another dimension attenuates consensus and affective acceptance. Without distinguishing these dimensions from one another, however, an observer would conclude that conflict, in general, produces inconsistent effects. Indeed, such observations prompted Eisenhardt and Zbaracki to call for research exploring "whether some sources of conflict are more beneficial than others" (1992: 34).

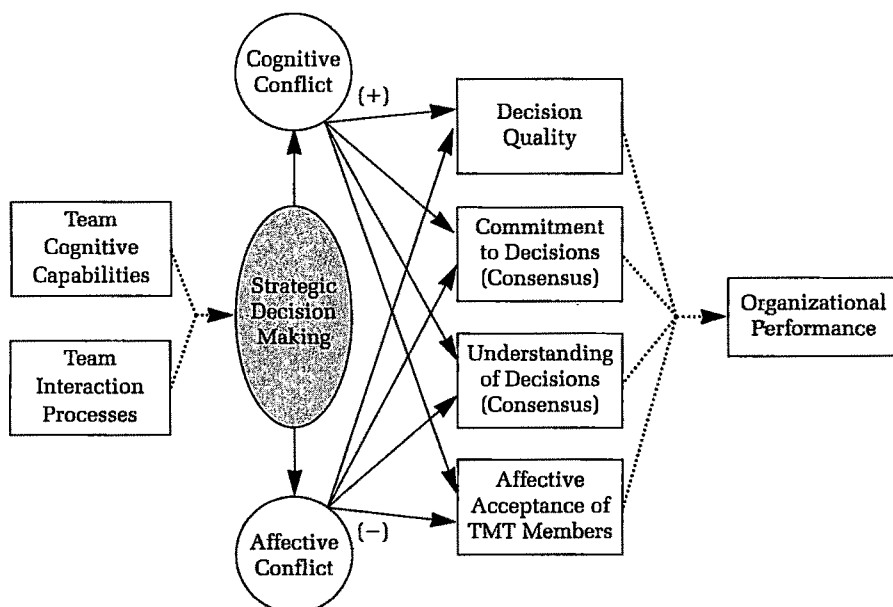
When conflict is functional, it is generally task oriented and focused on judgmental differences about how best to achieve common objectives (Brehmer, 1976; Cosier & Rose, 1977; Jehn, 1992; Priem & Price, 1991; Riecken, 1952; Torrance, 1957). This type of conflict is called *cognitive conflict* (Amason & Schweiger, 1994). Cognitive conflict is inevitable in top management teams because "different positions see different environments" (Mitroff, 1982b: 375). This perceptual diversity leads to conflict over how best to accomplish an organization's objectives (Astley, Axelsson, Butler, Hickson, & Wilson, 1982; Wiersema & Bantel, 1993). Cognitive conflict contributes to decision quality because the synthesis that emerges from the contesting of the diverse perspectives is generally superior to the individual perspectives themselves (Mason & Mitroff, 1981; Schweiger et al., 1986; Schweiger & Sandberg, 1989; Schwenk, 1990).

However, cognitive conflict should not adversely affect consensus and affective acceptance. In fact, cognitive conflict should enhance understanding. Schweiger and colleagues (1986, 1989) found that cognitive conflict encouraged thorough evaluation of an alternative's underlying assumptions. Cognitive conflict should also enhance commitment. As team members debate their perspectives, they exercise voice in the decision process (Folger, 1977). As a result, they should become more committed to the decision (Erez, Early, & Hulin, 1985; Folger, 1977; Greenberg & Folger, 1983). Hoffman and Maier (1961), for instance, found that group members' satisfaction with a decision was related to the influence they exercised over it.

For similar reasons, cognitive conflict should also enhance affective acceptance among top management team members. In a study of top management teams, Korsgaard, Schweiger, and Sapienza (1995) found that positive affect within teams was produced when sincere consideration was given to the input of team members.

Taken together, these findings suggest that cognitive conflict is altogether functional. Thus, as Figure 1 illustrates and the following hypotheses state, the cognitive conflict that emerges during strategic decision making should

FIGURE 1
Consistent and Contradictory Effects of Cognitive and Affective Conflict on Decision Quality, Commitment, Understanding, and Affective Acceptance^a



^a The relationships measured and tested in this study are represented by solid lines. The dotted lines represent implied relationships and are not being explicitly tested.

enhance decision quality, commitment, understanding, and affective acceptance.

HYPOTHESES

Hypothesis 1a: Teams that experience higher levels of cognitive conflict will produce higher-quality decisions.

Hypothesis 1b: Teams that experience higher levels of cognitive conflict will have higher levels of understanding of their decisions.

Hypothesis 1c: Teams that experience higher levels of cognitive conflict will have higher levels of commitment to their decisions.

Hypothesis 1d: Teams that experience higher levels of cognitive conflict will have higher levels of affective acceptance.

When conflict is dysfunctional, it tends to be emotional and focused on personal incompatibilities or disputes (Brehmer, 1976; Cosier & Rose, 1977; Jehn, 1992; Priem & Price, 1991; Riecken, 1952; Torrance, 1957). This type of conflict is called *affective conflict* (Amason & Schweiger, 1994).

Affective conflict seems to emerge in top management teams when cognitive disagreement is perceived as personal criticism. Brehmer argues that such misinterpretation can cause "purely cognitive disagreement [to] turn into a full-scale emotional conflict" (1976: 986). For instance, it is likely that the criticism and debate necessary for cognitive conflict could be interpreted as political gamesmanship, where one team member tries to gain influence at the expense of another (Eisenhardt & Bourgeois, 1988; Finkelstein, 1992). The resulting incredulity would trigger personal, affective conflict, fostering cynicism, avoidance, or countereffort that could undermine consensus and affective acceptance and jeopardize decision quality.

Distinguishing functional cognitive conflict from dysfunctional affective conflict makes the overall effects of conflict on strategic decision making easier to understand. As top management teams engage in cognitive conflict, they may inadvertently trigger affective conflict. This mutation produces the appearance of the paradox. Since the mutation goes unnoticed (Brehmer, 1976; Deutsch, 1969), it appears that the cognitive conflict produces a higher-quality decision but also lowers consensus and affective acceptance. In reality, however, cognitive conflict produces the desired effects. The inadvertently triggered affective conflict obscures and attenuates those effects.

So, cognitive conflict and affective conflict often occur together. However, as Figure 1 illustrates and the hypotheses state, the affective conflict that emerges during strategic decision making erodes decision quality, consensus, and affective acceptance.

Hypothesis 2a: Teams that experience higher levels of affective conflict will produce lower-quality decisions.

Hypothesis 2b: Teams that experience higher levels of affective conflict will have lower levels of understanding of their decisions.

Hypothesis 2c: Teams that experience higher levels of affective conflict will have lower levels of commitment to their decisions.

Hypothesis 2d: Teams that experience higher levels of affective conflict will have lower levels of affective acceptance.

METHODS

To test these hypotheses, I gathered data from top management teams in two industries, food processing and furniture manufacturing. In line with the suggestion of Bourgeois (1984), the larger food-processing sample provided the data for most of the statistical analyses and tests. The smaller furniture-manufacturing sample provided richness to and clinical support for the findings from the larger sample.

In both samples, multiple members of each top management team were questioned about a particular decision in which they had actually participated. Collecting the data in this fashion helped to ensure that, within each team, the individual recollections of the different team members would all be focused on the same event. Recollections are less likely to be distorted when they are referenced to a discrete event (Podsakoff & Organ, 1986). In addition, this study dealt with the relationship between the conflict experienced during a particular decision process and the subsequent by-products of that process. To isolate the "essential elements" (Locke, 1986) of that relationship, data about an actual and specific strategic decision had to be gathered from each team.

The top management team was defined as those managers who had actively participated in the decision in question. The teams were defined this way because the outcomes of a decision are largely a function of who is involved in the decision process (Hickson et al., 1986; Jackson, 1992). Team members were identified by asking a firm's CEO to describe a specific strategic decision and to identify the top managers who had actively participated in that decision. I then surveyed the CEO and the identified team members, using identical surveys. However, each team was sent a unique set of survey instructions, directing that the surveys be referenced to the decision that had been described by that team's CEO.

Sample One

This sample consisted of 48 top management teams from small and mid-sized food-processing firms across the United States. In the first step of the data collection, 260 firms were identified from an industry trade publication and a letter was sent to the CEO of each requesting participation. A short time later, each CEO was called. During the ensuing conversations, 94

CEOs agreed to participate and 68 declined. The remaining 98 CEOs could not be reached in the allotted time.

Those CEOs who agreed to participate were asked to describe a strategic decision and to list the names of the managers who had been actively involved in that decision. To prevent the CEOs from simply choosing good decisions, each was instructed to choose the most recent strategic decision that had been made and implemented at his or her company. This instruction should have produced a proportionate number of favorable and unfavorable decisions. I then sent surveys referencing the decisions to the CEO and to the identified team members. The surveys contained items designed to measure the cognitive and affective conflict the team experienced while making the decision, the quality of the decision, the understanding of and commitment to the decision, and the affective state of the team following the decision.

Attached to each survey was a letter guaranteeing anonymity and stating that the CEO (identified by his or her name) had agreed to participate in the study. This letter instructed each team member to complete the survey individually and to refer to the decision in question when addressing each item. As mentioned, although these instructions were different for each team in that they referred to a particular decision in that team's history, the actual questionnaires were identical for all of the respondents in the sample. Each individual was instructed to return his or her completed survey in the provided envelope. Each CEO was also sent a supplemental survey requesting general information on the firm and the team. Surveys were sent to a total of 329 managers at the 94 firms whose CEOs agreed to participate.

Surveys were also sent to the 98 CEOs who could not be reached by phone. Along with the surveys was a letter requesting that a CEO distribute one survey to each member of his or her "top management group." The letter explained that, for the surveys to be usable, they had to be completed by those top managers who actually participated in the strategic decision that the CEO would have to identify. Attached to each survey was a letter instructing each manager to refer to "the important decision identified by the CEO" when completing the questionnaires. The instructions also directed that the surveys be completed individually and returned in the provided envelopes. A total of 294 surveys were sent to these 98 firms.

To be included in the sample, a team had to provide at least two individual responses along with the supplemental information. From the 94 firms whose CEOs agreed to participate, multiple responses and the supplemental survey were received from 45 teams, a usable response rate of 47.8 percent. Complete responses were received from just 3 of the firms that had not previously agreed to participate, a response rate of 3.1 percent. Although data on the nonrespondents were limited, there were no obvious differences in the size or geographic locations of the responding and nonresponding firms. The information provided by the CEOs indicated that the average team in these 48 firms had 3.44 managers, with the largest team having 7 and the smallest team having 2 members. On average, 2.98 managers per team

completed and returned questionnaires. The 48 companies averaged 266 employees and \$52 million in sales.

Sample Two

This sample included five furniture manufacturing firms in the southeastern United States. Six firms were asked to participate, and five provided all of the necessary data. The average top management team in this group consisted of five managers, with the largest having seven and the smallest having three members. The firms averaged 1,092 employees and \$109 million in sales.

The data collection procedure for this group was similar to that used in the larger sample. Each CEO identified a recent strategic decision and the members of the firm's top management team. A survey referencing this decision was then sent to the CEO and to each team member. This time, however, the survey contained only the items for measuring the cognitive and affective conflict experienced during the decision. A total of 24 surveys were mailed, and 21 were completed and returned.

About two weeks later, interviews were conducted with 15 of those 21 managers. The first portion of each interview was structured. During this portion of the interview, each manager was read the items that had been used to measure decision quality, commitment, understanding, and affective acceptance in the first sample and asked to respond to them. The second portion of the interview was unstructured. During this portion of the interview, each manager was asked to give his thoughts on team decision making and on how the team performed during the decision in question. All of the interviews were tape recorded and transcribed. The transcripts were given to a panel of three doctoral students who scored each manager's responses to the structured items using the same scales that had been used for those items on the first survey. The interrater reliability among the panel was computed for each manager. The reliabilities averaged .93 and ranged from a high of .98 to a low of .80. Thus, the panel's scores for each manager were averaged to produce a set of quantified responses to the decision outcome items.

Measures

The same measurements were taken in both samples. The respondents in the larger sample provided all of their information on a survey. In the smaller sample, only the conflict data were collected with a survey; the outcome data were collected verbally and were then converted to numerical scores. The validity and reliability assessments of the measures were made using data from the larger sample.

Cognitive and affective conflict were measured with seven items from a scale developed and used by Jehn (1992, 1994). Three items were used to measure cognitive conflict and four items were used to measure affective conflict. The responses were recorded on five-point, Likert-type scales with

anchors ranging from 1, "none" to 5, "a great deal" (Schmitt & Klimoski, 1991).

The scale was assessed first with exploratory factor analysis. Since cognitive and affective conflict often occur together, an oblique rotation was used to produce a two-factor solution. As shown in Table 1, the factors were correlated (.39). The four affective conflict items loaded heavily on a single factor and produced a subscale reliability coefficient of .86. The three cognitive conflict items also loaded heavily on a single factor and produced a subscale reliability coefficient of .79. None of the items produced meaningful off-loadings. Together, the two factors were able to explain over 70 percent of the total variation in the seven items. I also subjected the scale to confirmatory factor analysis, using LISREL 8. In this analysis, the proposed two-dimensional model of conflict produced a chi-square statistic of 57.63—a value that, when divided by degrees of freedom, is below 5.0—as well as a goodness of fit index of .91 and a root mean square residual of .06. All of these indicate an acceptable degree of fit between the proposed model and the data. When taken together, the results of these analyses provide strong evidence that the measure captured two distinct dimensions of conflict.

Decision quality was measured with three items asking team members to rate, on a scale ranging from 1, "poor," to 4, "excellent," the overall quality of the decision, the quality of the decision relative to its original intent, and the quality of the decision given its effect on organizational

TABLE 1
Results of Factor Analysis for Cognitive and Affective Conflict^a

Items	Affective Conflict	Cognitive Conflict
Affective conflict		
1. How much anger was there among the group over this decision?	.789	.066
2. How much personal friction was there in the group during this decision?	.905	-.146
3. How much were personality clashes between group members evident during this decision?	.848	.088
4. How much tension was there in the group during this decision?	.770	.069
Cognitive conflict		
1. How many disagreements over different ideas about this decision were there?	.113	.796
2. How many differences about the content of this decision did the group have to work through?	-.083	.902
3. How many differences of opinion were there within the group over this decision?	.020	.790
Proportion of variance explained	70.62	
Interfactor correlation	.39	
Affective conflict subscale reliability	.86	
Cognitive conflict subscale reliability	.79	

^a *N* = 143.

performance. The items loaded on a single factor and produced a reliability coefficient of .91.

A perceptual measure of relative decision quality was used because an objective measure of the quality of a single decision is difficult to isolate. A decision that is good in one context may produce poor results if that context suddenly changes. Also, using an objective measure to evaluate different decisions implies that each decision has an equal chance of producing favorable outcomes. That, however, is not always the case. For example, a team may be forced to choose between poor alternatives. In such a case, an objective measure of decision quality would give the impression that the quality of the team's decision was lower than the quality of a decision produced by another team that had better alternatives from which to choose. It may be, however, that the first team chose wisely and emerged better than expected and the second team chose poorly and emerged worse than expected. Thus, the best way to gauge the quality of an individual strategic decision is to ask those who have observed its effects and who understand its context to judge, retrospectively and on several dimensions, how the decision turned out.

The *understanding* measure gauged how similarly team members understood the rationale for their decision. Each manager was asked to allocate ten points to six different areas such as "cost control and efficiency" and "new customer/market development" to indicate how heavily those concerns influenced the decision in question. For each team, the sum of the squared differences on the six items was divided by the team's size to produce a distance score. That score represents the level of disagreement among the team's members over the rationale underlying their decision. The distance score was subtracted from a constant so that the more similarly a team's members understood their decision, the higher their understanding score would be (cf. Dess, 1987; Wooldridge & Floyd, 1990).

Commitment was measured with six items adapted from Wooldridge and Floyd (1990). The responses to questions like "How much did you personally argue for the alternative that became the final decision?" and "How consistent was the final decision with your own personal priorities and interests?" were recorded on five-point scales. The items all loaded on a single factor and produced a reliability coefficient of .88.

Affective acceptance was measured with two items adapted from Schweiger and colleagues (1986, 1989) and Priem, Harrison, and Muir (1995). The responses to the questions "Did you enjoy working with the group on that decision?" and "How satisfied are you with the way that decision was reached?" were recorded on five-point scales. The items loaded on a single factor and produced a reliability coefficient of .73. Data on *team size*, *CEO tenure*, and *average team tenure* were collected directly from each CEO and were used as control variables.

Before creating team-level variables, I assessed the level of within-team individual agreement for the conflict and decision quality measures (Rousseau, 1985). A one-way ANOVA, using team affiliation as the independent variable, revealed that the between-team variance was significantly greater

($p < .0001$) than the within-team variance for all three of the measures. This finding suggests a substantial level of agreement within the teams. Additionally, the eta-squares for cognitive conflict, affective conflict, and decision quality were .64, .66, and .68, respectively. When the eta-square is greater than .20, it suggests that any two responses from within a team are more similar than any two responses from a sample at large (Florin, Giamartino, Kenney, & Wandersman, 1990). Again, this test result suggests a substantial level of agreement within the teams. Thus, the average of the individual responses was used as the team-level variable.

RESULTS

Table 2 contains the Pearson product moment correlation matrix and descriptive statistics for the variables in the large sample. Table 3 contains the Spearman rank correlation matrix and team-level descriptive statistics for the variables in the small sample. The Spearman rank correlation ranges from 1.00 to -1.00 and is calculated on the ranks of the variables rather than on their actual values. Thus, the coefficient represents an ordinal relationship wherein 1.00 is perfect correspondence and -1.00 is perfect discordance. Table 4 contains the team-level data for the small sample.

As expected, affective and cognitive conflict were correlated. Table 2 shows that correlation (.38) to be both positive and significant. Further support for the expectation that cognitive and affective conflict occur together can be found in the small sample, where the ordinal correspondence (.70) is again positive and nearly significant ($p = .12$). It is also interesting that, although positively correlated, cognitive and affective conflict are related differently to the decision outcomes. Across both samples, cognitive conflict is generally less negatively related to the decision outcomes than affective conflict.

Further inspection of Table 4 also reveals some interesting relationships. For instance, team 5 reported the highest levels of cognitive and affective conflict, decision quality, and understanding of any team in the sample but was next to last on affective acceptance. The CEO of team 5 characterized the quality of his team's decision as "tremendous." Nevertheless, he stated that the process was not particularly enjoyable and that "some people were unreasonable and had bad reactions." Another manager from team 5 agreed that "the decision turned out real well" but added that "there was a problem in reaching the decision." As the literature has shown, processes that produce high-quality decisions can leave a residue of negativity among a team's members (Schweiger et al., 1986, 1989). In the case of team 5, a high-quality decision and a significant amount of residual bitterness emerged from a process with high levels of both cognitive and affective conflict.

Team 1, on the other hand, had the lowest levels of decision quality and understanding in the sample. Team 1 was also below the sample average on both cognitive and affective conflict. In assessing the quality of his team's decision, one manager stated, "We knew that we would end up doing something . . . just recognizing that and starting down a road to do it is a great

TABLE 2
Pearson Product Moment Correlations and Descriptive Statistics^a

Variables	Mean	s.d.	1	2	3	4	5	6	7	8
1. Cognitive conflict	2.51	0.60								
2. Affective conflict	1.93	0.72	.38**							
3. Quality	3.02	0.66	-.09	-.38**						
4. Understanding	8.96	0.97	.02	-.18	.47**					
5. Commitment	3.78	0.75	-.13	-.34*	.67**	.41**				
6. Affective acceptance	3.74	0.84	-.04	-.59**	.64**	.37*	.81**			
7. TMT size	3.45	1.17	.35*	.28*	-.32*	-.50**	-.29*	-.32*		
8. TMT experience	7.37	6.46	-.37**	-.05	.11	.26†	.06	-.02	-.14	
9. CEO experience	11.02	7.36	.02	.25†	-.08	-.02	-.05	-.03	-.17	.16

^a $N = 48$ (top management teams).

† $p < .10$

* $p < .05$

** $p < .01$

TABLE 3
Spearman Rank Correlations and Descriptive Statistics^a

Variables	Mean	s.d.	1	2	3	4	5
1. Cognitive conflict	3.02	0.38					
2. Affective conflict	2.14	0.85	.70 (.12)				
3. Quality	3.31	0.23	.50 (.23)	.10 (.48)			
4. Understanding	9.29	0.44	.90 (.04)	.60 (.18)	.70 (.12)		
5. Commitment	3.58	0.27	.10 (.48)	.40 (.26)	.30 (.34)	.00 (.53)	
6. Affective acceptance	3.52	0.37	-.60 (.18)	-.90 (.04)	.20 (.39)	-.50 (.23)	.00 (.53)

^a $N = 5$ (top management teams). Values in parentheses are probability levels for the Spearman rank correlations.

TABLE 4
Team-Level Data^a

Team	Cognitive Conflict	Affective Conflict	Quality	Understanding	Commitment	Affective Acceptance
1	2.71	1.94	3.07	8.76	3.69	3.39
2	3.33	2.19	3.11	9.72	3.30	3.17
3	2.67	1.58	3.28	8.98	3.54	3.83
4	2.89	1.42	3.44	9.26	3.89	4.00
5	3.50	3.56	3.63	9.73	3.98	3.22

^a $N = 5$ (top management teams). Values are means.

result." Another manager described the process of reaching the decision by stating, "It was enjoyable simply because I knew we had to make a change." Although everyone agreed that a change was needed, there was little agreement over the basic rationale for the change. The company president listed innovation and new product development as the predominant issue in the decision. Another manager dismissed altogether the issue of new product development and stated that trust among the company's employees was the primary issue. Finally, a third team member reported that there was no predominant rationale for the decision. Perhaps the shared belief that "something" had to be done curtailed discussion of the fundamental rationale for the decision. Such an explanation would be consistent with descriptions of the groupthink phenomenon (Janis, 1982). Clearly, there were some basic and unresolved differences of opinion among the team members over this decision. The presence of more conflict might have brought those differences to the surface.

These examples illustrate the paradox that top management teams face. The quality and overall understanding of a decision appears to improve with the introduction of conflict. However, conflict often turns out to be like Pandora's box; once released, its forces can become uncontrollable and potentially damaging.

Hypothesis Tests

Multiple regression analysis was used to test the hypothesized relationships of cognitive and affective conflict to the four outcome measures. Two models were developed for each set of relationships. The first model predicted the outcome variable from the control variables. A second model, including cognitive and affective conflict, was then developed and compared to the first. Since affective and cognitive conflict were correlated, I assessed the potential for multicollinearity by regressing each on the other independent variables in the model. As the R^2 for these models approaches 1.00, it indicates severe multicollinearity (Berry & Feldman, 1985). The model for cognitive conflict produced an R^2 of .31, and the model for affective conflict produced an R^2 of .24. Although small, these R^2 s may still suggest some collinearity. However, the presence of multicollinearity should not make the hypothesis tests any less conservative (Berry & Feldman, 1985). In other

words, if the parameter estimates for cognitive and affective conflict are significant, the hypotheses will be supported despite any multicollinearity that may be present.

Each hypothesis was tested twice, once with data from the full, larger sample and a second time with data from a split group of the larger sample developed by randomly splitting each team into halves. The dependent variables were taken from one half and the independent variables were taken from the other half of each team. So, for each team, the conflict scores came from one half of the team's members and the outcome scores came from the other half (cf. Smith, Organ, & Near, 1983). This procedure helped remove common method variation, like cognitive consistency and hypothesis-guessing effects, from the data (Podsakoff & Organ, 1986). If the results from the split sample confirmed those of the full sample, it would provide reinforcing evidence of the hypothesized effects.

Hypotheses 1a and 2a state that cognitive conflict will be positively related to decision quality, but affective conflict will be negatively related to decision quality. As illustrated in Table 5, a model predicting decision quality from the control variables produced an R^2 of .128. Including the conflict variables improved the R^2 to .222, a change of .094. Cognitive conflict was positively related to decision quality, but the relationship fell short of significance ($b = .205$; $p = .129$). Affective conflict was significantly and negatively related to decision quality ($b = -.311$; $p = .017$). In the split sample, cognitive conflict was positively and significantly related to decision quality ($b = .336$, $p = .027$), and affective conflict was again significantly and negatively related to decision quality ($b = -.246$, $p = .031$). Thus, findings support both Hypotheses 1a and 2a.

Hypotheses 1b and 2b state that cognitive conflict will be positively related to understanding, but affective conflict will be negatively related to understanding. The control model produced an R^2 of .302. Including the conflict variables improved the model's R^2 to .411, a change of .109. As predicted, cognitive conflict was significantly and positively related to understanding ($b = .641$, $p = .004$). Affective conflict, however, was not related to understanding. Because understanding was measured as the distance among team members, the split sample procedure could not be used to confirm this finding. Thus, the results from the full sample support Hypothesis 1b but not Hypothesis 2b.

Hypotheses 1c and 2c state that cognitive conflict will be positively related to commitment, but affective conflict will be negatively related to commitment. The control model produced an R^2 of .094. Including the conflict variables improved the model's R^2 to .162, a change of .068. Even with this improvement, however, the model of commitment as a function of conflict and the control variables was not significant ($F = 1.63$, $p = .174$). This remained the case when the split sample data were analyzed. So, no support was found for Hypotheses 1c and 2c.

Hypotheses 1d and 2d state that cognitive conflict will be positively related to affective acceptance, but affective conflict will be negatively related

TABLE 5
Results of Regression Analysis and Significance Tests^a

Dependent Variables	TMT Size	TMT		CEO		Cognitive Conflict	Affective Conflict	R ²	ΔR^2	p
		Experience	Experience	Experience	Experience					
Decision quality										
Control model	-.187	.009		-.013				.128		.107
Full model	-.158	.014		-.006		.205	-.311*	.222	.094	.053
Split sample	-.130	.021		-.001		.336*	-.246*	.194		.096
Understanding										
Control model	-.408	.032		-.017				.302		.001
Full model	-.484	.052		-.020		.841**	-.149	.411	.109	.000
Commitment										
Control model	-.193	.004		-.011				.094		.224
Full model	-.146	.005		-.002		.099	-.312*	.162	.068	.174
Split sample	-.234	.021		.002		.184	-.157	.171		.147
Affective acceptance										
Control model	-.245	-.007		-.009				.111		.154
Full model	-.155	.001		.010		.411*	-.774**	.450	.339	.000
Split sample	-.256	.019		.004		.561**	-.455**	.316		.006

^a N = 48 (top management teams).

* p < .05

** p < .01

to affective acceptance. The control model produced an R^2 of .111. Including the conflict variables improved the model's R^2 to .450, a change of .339. As predicted, cognitive conflict was significantly and positively related to affective acceptance ($b = .411, p = .019$). Also as predicted, affective conflict was significantly and negatively related to affective acceptance ($b = -.774, p < .0001$). These findings were confirmed in the split sample, where cognitive conflict was significantly and positively related to affective acceptance ($b = .561, p = .007$) and affective conflict was significantly and negatively related to affective acceptance ($b = -.455, p = .004$). Thus, Hypotheses 1d and 2d each received strong support.

These results are comparable to those found in the smaller sample, where affective conflict and affective acceptance were found to be strongly negatively correlated and cognitive conflict and understanding were found to be strongly positively correlated (Table 3). The pattern seems to be that, when significant, the effects of cognitive conflict are positive and, when significant, the effects of affective conflict are negative.

To test the collective strength of these relationships, I calculated a canonical correlation between both of the conflict variables and the outcome variables, using the data from the larger sample. As expected, there was a strong relationship between conflict and the outcome variables. A significance test of this correlation produced an approximate F value of 13.89 ($df = 4, 43, p < .0001$). Together, cognitive and affective conflict were able to account for 17.5 percent of the total variation in the four outcome variables.

DISCUSSION

Like previous studies, this study found that conflict can improve decision quality. Moreover, this study found that it is the cognitive dimension of conflict that accounts for the improvement. Cognitive conflict was also positively related to understanding and affective acceptance. Affective conflict, on the other hand, appeared to be injurious to decision quality and affective acceptance. These consistent but contradictory effects explain why decision quality, consensus, and affective acceptance appear to have such difficulty coexisting. Many studies have reported that decision quality and understanding are enhanced when conflict is stimulated. Many of these same studies, however, have noted that increased quality comes at the expense of consensus and team member affect. It may well be that attempts to stimulate functional conflict often inadvertently trigger dysfunctional conflict. Indeed, one of the interviewed managers stated that "sometimes disagreement can be good and other times it can backfire." In past studies, when positive and negative effects were observed, researchers had no choice but to attribute them to a single source—thus, the paradox. This study moves the discourse forward by demonstrating that this paradox need not exist.

Decision quality is enhanced when multiple perspectives are brought to bear on a particular issue. The laboratory studies conducted by Schweiger and colleagues (1986, 1989) demonstrated that decision quality improves with the introduction of dialectically styled decision processes. This relation-

ship also seems to exist in the field. Most of the interviewed managers commented that decision quality improves as divergent opinions are sought and considered. The data appear to confirm this in that issue-focused cognitive conflict was positively related to decision quality.

However, higher-quality decisions were not positively related to all conflict. In fact, although cognitive conflict appears to improve decision quality, affective conflict likely erodes it. This relationship suggests a potential danger. If what begins as cognitive disagreement becomes affective conflict, it can disrupt the process and undermine decision quality. For example, the members of team 2 described their decision to spend millions on new computerized machinery as the product of a rigorous and thorough process. The data showed that this team experienced a fair amount of cognitive conflict. It became clear during the interviews, however, that the conflict occasionally expanded beyond the issue at hand. The company's general manager, for instance, reported that there was too much disagreement and that much of it "was only for criticism's sake, without the goal of improvement." The data show that the team also experienced a considerable amount of affective conflict. In assessing the quality of the decision, all of the managers reported that, although generally successful, the decision had been "less than we had hoped." Indeed, team 2's score for decision quality was below the sample average.

Previous studies also have noted that even when conflict improves decision quality, it may weaken consensus, making a decision difficult to implement. Again, this need not be the case. The data suggest that the cognitive dimension of conflict does nothing to weaken consensus. In fact, cognitive conflict actually seemed to enhance team members' degree of understanding of their decisions. This finding is certainly consistent with the findings of others. Schweiger and colleagues (1989) found that teams that used conflict-inducing interaction techniques more thoroughly considered and more rigorously examined the assumptions underlying different alternatives. Mitroff also argued that the conflict induced by dialectical interaction produces a "learning process, whereby through active, heated, and intense debate . . . the parties come to discover and to invent entirely new alternatives" (1982a: 222). In both samples, teams that experienced greater cognitive conflict better understood the rationale underlying their decisions.

Although no relationship was found between conflict and commitment, strong relationships existed between both cognitive and affective conflict and affective acceptance. Recent research has shown that team members respond positively to decision processes that are open to and considerate of their concerns (Korsgaard et al., 1995). Cognitive conflict may be symbolically significant for team members in that it provides evidence that the decision-making process itself is fair and open and that other team members are genuinely concerned more for the team or the organization than for themselves. It seems likely then that, if the conflict becomes affective, the reaction will be just the opposite. Personal and individual criticisms could easily be construed as hostile and unfair attempts to promote one member of the group

at the expense of the others. Even if these criticisms are legitimate and well intentioned, they will likely undermine the attachment that team members feel toward one another.

For example, recall the experience of team 5. That team made a complex and highly consequential decision to change the way its company manufactured its products. As the data show, this decision process was characterized by a substantial amount of both cognitive and affective conflict. Although the managers all agreed that the decision had turned out very well, there remained considerable bitterness over the process itself. That lingering bitterness, manifested in the team's low affective acceptance score, seems to have arisen from what one manager called the "hard-nosed" tactics of a particularly "obstinate" team member. The president of the company explained that, although this particular manager raised valid concerns, they were not well received because of the way in which they were presented.

CONCLUSIONS

The principal implication of this study is that, to the extent that cognitive conflict can be encouraged while affective conflict is restrained, top management teams may be able to "gain the benefits of conflict without the costs" (Eisenhardt & Zbaracki, 1992: 34). Many have speculated that group effectiveness will improve with the introduction of conflict. To date, however, the evidence has been inconclusive. In many cases, conflict does appear to improve decision quality. What is perplexing, though, is that conflict also appears to disrupt group affect. The first step to resolving this conundrum is to recognize that conflict comes in at least two distinct but related forms and that to address one while ignoring the other is to invite trouble. To improve decision making, teams should encourage cognitive conflict. At the same time, however, they should discourage affective conflict. By doing both, teams should produce higher-quality decisions along with higher levels of consensus and affective acceptance.

It is hoped that this study will inspire further research into the role of conflict in strategic decision making. Researchers may want to begin by addressing some of the limitations of this study. For instance, I focused on small and midsize firms, choosing smaller firms because they have smaller, more easily identifiable teams whose members are likely to work in close proximity to one another. Team size and the proximity of its members can influence the richness of a team's interactions (Daft & Lengel, 1986). The dynamics among the top managers in larger organizations may be very different. For instance, Hambrick's (1994) description of top management groups suggests a different sort of decision process than that depicted in this study. The lack of frequent, personal contact may influence the way a team perceives and handles conflict.

The focus on actual strategic decisions may also be a limitation. The need for detailed information certainly affected the sample size. The difference in the response rates of those firms contacted by phone before being sent surveys (47.8%) and those that were sent surveys without prior contact (3.1%) is

notable. Because of the work involved, researchers may view replication of this procedure with some trepidation. Also, differences in the decisions themselves could produce between-team variation that simply cannot be controlled. This potentiality, however, should be weighed against the benefits of the procedure. Focusing on a discrete event eliminates much recollection bias (Podsakoff & Organ, 1986). Focusing on a single decision also provides information on how real strategic decisions are actually made. For this study, these benefits made the decision-specific focus more desirable than the alternative, which would have been to pose hypothetical questions and hope that genuine team dynamics ensued.

Several theoretical issues also might serve as the subject of future research. For example, it is apparent that some top management teams simply do a better job of managing conflict than others (Amason, Thompson, Hochwarter, & Harrison, 1995; Eisenhardt, 1989). These teams seem able to engage in cognitive conflict without arousing affective conflict. Not surprisingly, these teams tend to be successful. Thus, future researchers may want to focus on the antecedent conditions of cognitive and affective conflict. Studies investigating the influence of team norms, CEO behavior, and team reward systems on the occurrences of cognitive and affective conflict would be enlightening. Perhaps teams do themselves harm by encouraging cognitive conflict, thinking it is the right thing to do, before they are prepared to deal with its consequences. For instance, some have suggested that a cooperative reward system is important for effective strategic decision making (Gomez-Mejia & Balkin, 1992; Tjosvold & Deemer, 1980). Perhaps a cooperative reward context would reduce the tendency for cognitive disagreements to arouse affective conflict. If so, such a cooperative system should probably be in place before attempts to encourage conflict are initiated.

Other studies could extend the compositional research on top management teams, using cognitive and affective conflict as dependent variables, to explore the relationship between heterogeneity, homogeneity, or size and the appearance of functional and dysfunctional conflict. In this regard, the strong positive correlation between team size and both cognitive and affective conflict is notable (Table 2). The issue of diversity may also need to be considered from the perspective of its effect on conflict. Hambrick (1987) suggested that top management teams may need heterogeneity on some characteristics and homogeneity on others. It may be that some types of diversity lead to cognitive conflict and other types lead to affective conflict. Such a distinction could shift the focus of demographic research on top management teams away from the quantitative aspects of team diversity and onto its more qualitative aspects. Still other researchers may want to revisit the studies of conflict-inducing decision-making techniques like DI, DA, and NG to learn which procedures produce which types of conflict, and in what amounts.

Further study of these types of issues will considerably increase understanding of the role of conflict in strategic decision making. Ultimately, that richer understanding will produce concrete benefits for theorists and practitioners alike.

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SOCIALIZATION TACTICS: LONGITUDINAL EFFECTS ON NEWCOMER ADJUSTMENT

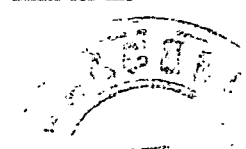
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In this longitudinal field study, we used self-report data provided by business school graduates after four months and ten months on new jobs to assess (1) the effects of the six socialization tactics from Van Maanen and Schein's (1979) typology on newcomer adjustment and (2) refinements of existing measures of the investiture tactic and role innovation. Results indicate that the tactics, clustered into an institutionalized (vs. individualized) approach, were negatively related to attempted and actual role innovation, role ambiguity, role conflict, stress symptoms, and intentions to quit and positively related to job satisfaction, organizational commitment, and organizational identification. Self-appraised performance was associated with more individualized socialization.

The processes through which individuals and organizations learn about and influence one another have long been a central focus of the organizational literature (e.g., Argyris, 1957; Perrow, 1986). Individuals are particularly susceptible to influence during role transitions, such as organizational entry, because of the great uncertainty regarding role requirements. The process of *organizational socialization* "entails the learning of a cultural perspective . . . [i.e.] a perspective for interpreting one's experiences in a given sphere of the work world" (Van Maanen & Schein, 1979: 212). As such, socialization focuses on how individuals learn the beliefs, values, orientations, behaviors, skills, and so forth necessary to fulfill their new roles and function effectively within an organization's milieu (Fisher, 1986; Van Maanen, 1976). Thus, socialization facilitates the adjustment of newcomers to organizations.

Although many formal and informal socialization strategies have been found to influence newcomers' adjustment and socialization outcomes (Fisher, 1986; Louis, Posner, & Powell, 1983), one of the best-developed theoretical models of socialization is Van Maanen and Schein's (1979) typology of socialization tactics. As discussed shortly, Van Maanen and Schein proposed six tactics that organizations can use to structure the socialization experiences of newcomers. They argued that socialization tactics influence the role orientations that newcomers ultimately adopt. Despite the cogency

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of this typology, research on the tactics has been relatively scarce. As Wanous (1992; Wanous & Colella, 1989) noted, there is a pressing need to replicate this research with longitudinal designs across a variety of organizations.

Hence, the purpose of the present study was to examine and extend Van Maanen and Schein's (1979) model of socialization tactics. More specifically, we examined how the tactics jointly affected the work adjustment of recent business school graduates after four and ten months in their new jobs. Consistent with earlier research, this study includes role orientation (attempted and actual role innovation), organizational stressors (role ambiguity and role conflict), and indicators of job and organizational attachment (job satisfaction, organizational commitment, and intentions to quit) as variables measuring adjustment. Further, we included four critical adjustment variables that have not been examined in previous research on socialization tactics—person change, stress symptoms, organizational identification, and self-appraised performance. Finally, we proposed and evaluated refinements of certain measurements of the socialization constructs (i.e., role innovation and one of the socialization tactics, investiture). These evaluations are conducted in conjunction with the above.

VAN MAANEN AND SCHEIN'S MODEL

Van Maanen and Schein (1979) argued that each of the six socialization tactics they proposed consists of a bipolar continuum. The tactic of *collective* (vs. *individual*) socialization refers to grouping newcomers and putting them through a common set of experiences, rather than handling each newcomer alone and putting him or her through a more or less unique set of experiences. *Formal* (vs. *informal*) socialization is the practice of segregating a newcomer from regular organization members during a defined socialization period, as opposed to not clearly distinguishing a newcomer from more experienced members. The *sequential* (vs. *random*) tactic refers to a fixed sequence of steps that leads to the assumption of the new job role, compared to an ambiguous or changing sequence. *Fixed* (vs. *variable*) socialization provides a timetable for the assumption of the role, whereas a variable process does not. A *serial* (vs. *disjunctive*) process is one in which the newcomer is socialized by an experienced member, compared to a process in which a role model is not utilized. Finally, *investiture* (vs. *divestiture*) affirms the incoming identity and personal characteristics of the newcomer rather than denying them and stripping them away.

Building on Van Maanen and Schein (1979), Jones (1986) contended that the six tactics form a gestalt that he termed *institutionalized socialization*. According to Jones, collective, formal, sequential, fixed, serial, and investiture tactics encourage newcomers to passively accept preset roles and thus maintain the status quo. Conversely, at the opposite end of the socialization continuum, individual, informal, random, variable, disjunctive, and divestiture tactics encourage newcomers to question the status quo and develop their own approach to their roles. Consequently, Jones referred to this end of the continuum as *individualized socialization*. However, contrary to Jones,

Van Maanen and Schein (1979) argued that the fixed and investiture tactics should predict an individualized role orientation because a fixed timetable for assumption of a role provides newcomers with the security they need to deviate from the status quo, and investiture allows newcomers to retain their idiosyncrasies, thus facilitating an innovative approach.

Jones (1986) developed six 5-item self-report scales to measure the tactics (see Methods). Ashforth, Saks, and Lee (1996), using the same data set as the present study, examined the dimensionality of the scales and found that (1) a six-factor model (in which each tactic comprises one factor) represented the observed data somewhat better than competing models and (2) the six tactics covaried as predicted by Jones. Ashforth and colleagues concluded that the institutionalized tactics reflect a more *structured* program of socialization, whereas the individualized tactics reflect a relative absence of structure. With the exception of divestiture (vs. investiture), the individualized tactics—in toto—are defined primarily by what they are *not*: they do not involve grouping newcomers and subjecting them to a common set of experiences, they do not involve segregating a newcomer from others, they do not involve a well-defined series of stages that unfold according to a set timetable, and they do not involve the use of a mentor or role model. Indeed, individualized socialization may occur more by default than by design.

However, the investiture tactic likely covaried with the institutionalized tactics not because it is more structured than divestiture (it often is not), but because the sample Ashforth and colleagues studied consisted of business school graduates. Organizations presumably hire business school graduates in part for the values and capabilities they have acquired through education and so would be expected to put more effort (structure) into reinforcing the incoming qualities of the graduates than into questioning them. Thus, Ashforth and colleagues' tentative conclusion was that, depending on the sample, collective, formal, sequential, fixed, serial, and investiture tactics covary as Jones (1986) predicted; however, this covariance may reflect a general "structural" factor. Further, we argue in the present article that the investiture tactic may be related to certain adjustment variables in a different manner than the other tactics.

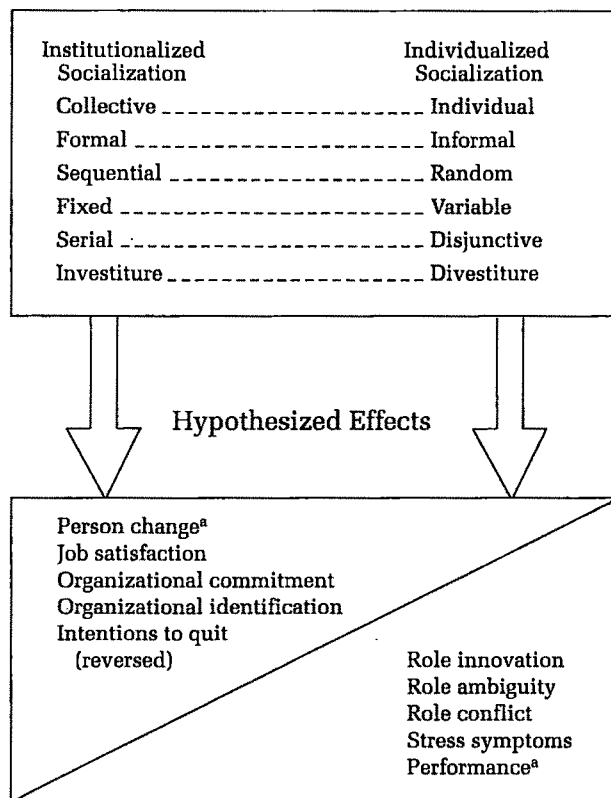
Figure 1 summarizes the placement of the six socialization tactics on the bipolar continuum. The figure also depicts the hypothesized effects of the tactics on newcomer adjustment discussed in the following section.

NEWCOMER ADJUSTMENT

Role Change and Person Change

As noted, Jones (1986) hypothesized that the tactics reflecting institutionalized socialization encourage newcomers to passively accept an organizational status quo, producing a *custodial role orientation*. Conversely, individualized socialization encourages newcomers to develop unique approaches to their roles, producing an *innovative role orientation*. Previous research found each of the six tactics to be significantly correlated with the hypothe-

FIGURE 1
Socialization Tactics and Their Hypothesized Effects



^a Investiture (vs. divestiture) is hypothesized to be negatively related to person change and, in this present sample of business school graduates, positively related to performance.

sized role orientation when socialization and role orientation were assessed contemporaneously after five months (Jones, 1986) and six months on the job (Allen & Meyer, 1990a) and when role orientation was reassessed after a further lag of six months (Allen & Meyer, 1990a). Using a sample of American expatriate managers with varying tenures, Black (1992) found that the serial and fixed tactics were negatively correlated with role innovation, whereas the collective tactic was positively correlated with role innovation.¹ Finally, Mignerey, Rubin, and Gorden (1995) collapsed the six tactics into an institu-

¹ Black (1992: 175) hypothesized that collective socialization would be positively associated with role innovation "because of the nature of the [overseas] assignments and the selection process." Thus, experienced expatriate managers were predisposed to role innovation, and the collective process served to reinforce this predisposition. Presumably, the organizational settings accommodated this innovative orientation.

tionalized socialization scale and found that it was not significantly correlated with role orientation for newcomers with less than one year's experience; in a subsequent path analysis, however, the scale was negatively associated with an innovative orientation.

All of the above tactic–role orientation associations reflect simple bivariate correlations. Given a pattern of moderate to high correlations between the socialization tactics (cf. Allen & Meyer, 1990a; Baker & Feldman, 1990; Baker, 1989; Black, 1992; Jones, 1986), we assessed the joint impact of the tactics on newcomers' role orientations. Specifically, we used canonical correlation analysis to assess the association between the set of socialization tactics and newcomers' role orientations.

Finally, research on the socialization tactics has thus far focused primarily on changes in the way a newcomer performs a role and not on changes to the newcomer as a person. This neglect is surprising since, as noted, socialization has in fact been defined as the process through which newcomers learn how to fulfill their roles and adjust to an organizational milieu. Following Nicholson and West (1988), we defined *person change* in the context of work adjustment as alterations in an individual's values, attitudes, personality, and career plans. Because central aspects of the self, like values and personality, tend to be resistant to change, socialization primarily influences what Schein (1971) referred to as the more "labile" self, although more profound changes can occur under certain circumstances—for example, within a total institution or strong culture (Cushman, 1986; Stradling, Crowe, & Tuohy, 1993). All but one of the tactics that reflect institutionalized socialization should predict at least some person change. Collective, formal, sequential, fixed, and serial tactics encourage newcomers to adapt to the status quo and thus may foster person change. However, the investiture tactic should be negatively related to person change since it ratifies the newcomer's incoming identity (Van Maanen & Schein, 1979).

Two important provisos to these arguments are warranted. First, although individualized socialization also has the potential to induce personal change (much like a self-directed process of discovery), this is usually not its focal purpose. Thus, individualized socialization is not expected to foster person change to a significant extent. Second, we are assuming that the recruitment and selection process does not result in a perfect organization–newcomer fit. In the attraction–selection–attrition model, Schneider (1987) maintained that organizations attract newcomers, and newcomers select organizations, on the basis of perceived fit. Thus, in theory, the recruitment and selection process can substitute for socialization (Chatman, 1991). In practice, however, no matter how thorough that process is, there is usually a need for at least residual organizational and individual adjustment.

This discussion of the impact of socialization on role and person change suggests the following hypotheses:

Hypothesis 1: The tactics that reflect institutionalized socialization will be negatively associated with role innovation.

Hypothesis 2a: The investiture tactic will be negatively associated with person change.

Hypothesis 2b: The remaining tactics that reflect institutionalized socialization will be positively associated with person change.

Indicators of Newcomer Adjustment

In addition to role change and person change, socialization can affect a variety of constructs that reflect newcomer adjustment. Jones (1986) argued that institutionalized socialization tends to provide information that reduces the uncertainty and anxiety inherent in early work experiences. In support, he found that the six tactics associated with institutionalized socialization were negatively associated with role ambiguity, role conflict, and intentions to quit and positively associated with job satisfaction and organizational commitment. Five other studies related Jones's (1986) measures of the socialization tactics to newcomer adjustment: Baker (1989) found that institutionalized socialization was negatively associated with intentions to quit, and positively associated with job satisfaction and organizational commitment; both Allen and Meyer (1990a) and Baker (1992) reported a positive association between institutionalized socialization and organizational commitment; Baker and Feldman (1990) found that institutionalized socialization was positively associated with peer trust, management trust, job satisfaction, and organizational commitment but had mixed effects on job tension and was not related to job involvement; and Mignerey and colleagues (1995) reported that institutionalized socialization was negatively associated with role ambiguity and positively associated with organizational commitment, satisfaction with communication in an organization, and an individual's confidence in perceptions of his or her supervisor. Additionally, drawing on observations, Zahrlly and Tosi (1989) categorized newcomers into either formal/collective (institutionalized) or informal/individual (individualized) socialization groups and found that membership in the former was positively correlated with job satisfaction and cohesion and negatively correlated with role conflict; membership was not, however, significantly associated with job involvement or role ambiguity.

However, of all the relationships reported in studies using Jones's (1986) measures, only the socialization-commitment relationship reported by Allen and Meyer (1990a) has been assessed longitudinally. Thus, the present study replicates and extends this research by (1) assessing the impact of the socialization tactics both cross-sectionally and longitudinally and (2) exploring additional newcomer adjustment variables. As mentioned, consistent with earlier research, the set of adjustment variables includes organizational stressors (role ambiguity, role conflict) and indicators of job and organizational attachment (job satisfaction, organizational commitment, intentions to quit). Three other variables are also included. First, given that a critical function of institutionalized socialization is to reduce newcomers' anxiety (Nelson,

1987), we also include a measure of *stress symptoms*. As Fisher (1986) noted, stress is typically posited in socialization models but rarely assessed in socialization studies. The assessment of stress symptoms will complement the assessment of the two stressors, role ambiguity and role conflict.

Second, given that another critical function of institutionalized socialization is to transform newcomers into exemplars of their organizations, the study also includes a measure of *organizational identification*, the extent to which an individual defines himself or herself in terms of the organization and what it is perceived to represent (Ashforth & Mael, 1989). Spenser and Otto (1985) reviewed longitudinal research indicating that work history often exerts a strong impact on self-concept. However, the impact of socialization tactics on organizational identification, as defined here, has not been addressed. As noted, socialization involves learning an organization's cultural perspective. Thus, it seems likely that the more institutionalized the socialization tactics, the more a coherent sense will be conveyed of *what* the organization purportedly represents and *how* one should construe events and meaning. This coherent sense provides a relatively clear referent for identification. Accordingly, institutionalized socialization should be positively associated with organizational identification.

Third, because the ultimate purpose of socialization is to ensure that newcomers perform their duties effectively, we also included a measure of *performance*. If performance is defined as conformity with institutional expectations, we would expect institutionalized socialization to predict such conformity. However, if performance is defined more broadly and dynamically as the magnitude of achievement in such areas as the quality and quantity of work, then—with the exception of one tactic—we would expect *individualized* socialization to predict performance. As Baker (1989) suggested, the use of collective, serial, and fixed tactics in institutionalized socialization may facilitate the emergence of powerful performance norms that constrain the individual's latitude. The result is steady but not stellar performers. Conversely, just as individualized socialization is argued to encourage an innovative role orientation, so too may it reduce constraints on achievement. Thus, Baker (1989) found that individualized socialization was positively associated with internal work motivation.

However, there are two important sample-specific qualifications to our socialization-performance hypothesis. First, reducing the normative constraints on performance not only allows greater latitude for success; it also allows greater latitude for failure. Given our present sample of business school graduates and the tendency of such graduates to view jobs and careers as central life interests (Lee & Ashforth, 1991), we anticipated that individualized socialization would be positively related to performance. In a more heterogeneous sample, we might expect individualized socialization to simply produce greater variance in performance.

Second, the impact of the investiture/divestiture tactic on performance also likely depends on the sample studied. As argued, organizations hiring business school graduates might be expected to reinforce rather than chal-

lenge the incoming attributes that the graduates have presumably acquired through education. However, this may not be true in other samples and in certain organizations. For example, one could argue that the more unique an organization's mission, identity, and culture, the more effort it devotes to divesting newcomers of their incoming attributes and predispositions. For instance, during boot camp, military service organizations isolate recruits from the outside world, shear their hair and require them to wear uniforms, disparage their abilities, encourage conformity rather than individuality, and carefully regulate behavior (Dyer, 1985). In such cases, performance is facilitated by divestiture, not investiture.

In sum, given our sample of graduates, we would expect organizations to put more effort into building on the attributes acquired through education rather than on breaking them down, and these attributes should contribute to individual performance. Thus, Baker and Feldman (1990) found that investiture was positively related to internal work motivation in a mixed sample of technical, managerial, and clerical personnel. Conversely, newcomers lacking the desired values and abilities, or holding values and abilities inconsistent with organizational needs, would more likely be subjected to divestiture.

This discussion of the effects of socialization on newcomer adjustment suggests the following hypotheses:

Hypothesis 3: The tactics that reflect institutionalized socialization will be negatively associated with (a) role ambiguity, (b) role conflict, and (c) stress symptoms.

Hypothesis 4: The tactics that reflect institutionalized socialization will be positively associated with (a) job satisfaction, (b) organizational commitment, and (c) organizational identification and negatively associated with (d) intentions to quit.

Hypothesis 5a: The investiture tactic will be positively associated with performance.

Hypothesis 5b: The remaining tactics that reflect institutionalized socialization will be negatively associated with performance.

Dynamics of Socialization over Time

We have thus far not distinguished between the impact of the socialization tactics on newcomers at four months and ten months. This is because we believe that the various hypothesized effects of socialization will persist for at least the first ten months of work. However, as the developers of various stage models of socialization (e.g., Feldman, 1976; Katz, 1980; Porter, Lawler, & Hackman, 1975) have suggested, the needs and foci of newcomers are likely to change over time. Research typically emphasizes the surprise, reality shock, and uncertainty newcomers encounter when they enter an organization for the first time and their corresponding desires for information,

identity, social support, and legitimacy (e.g., Louis, 1980; Marion, 1989). Consequently, as Hypotheses 3 and 4 imply, inexperienced newcomers are inclined to welcome institutionalized socialization because its tactics are suited to address those desires.

However, as newcomers begin to develop a more secure sense of who they are and how they fit in, other desires may emerge (Katz, 1980). These desires likely vary widely across newcomers. Some may seek challenge and growth, others may seek comfort and stability; some may focus on developing task expertise, others, on developing friendships or political alliances. The upshot is that many newcomers may become less receptive to institutionalized socialization practices and more receptive to a variety of other stimuli in the workplace. Therefore, we also examined how the impact of the socialization tactics on newcomer adjustment at four months differed from their cumulative impact at ten months. However, we offer no specific hypothesis because the various stage models of socialization provide little consensus regarding either the time frames for such metamorphoses or the emerging concerns of newcomers.

REFINEMENTS OF THE MEASURES

Investiture

Jones defined investiture as "the degree to which newcomers receive positive or negative social support after entry from experienced organizational members" (1986: 265). Thus, the measure includes such items as "Almost all of my colleagues have been supportive of me personally" and "My colleagues have gone out of their way to help me adjust to this organization." This definition of investiture as social support differs significantly from Van Maanen and Schein's original formulation of the concept as "the degree to which a socialization process is constructed to either confirm or disconfirm the entering identity of the recruit. *Investiture socialization* processes ratify and document for recruits the viability and usefulness of those personal characteristics they bring with them to the organization" (1979: 250). Van Maanen and Schein focused on the extent to which an organization accepts or challenges a newcomer's incoming identity and personal attributes. To be sure, social support can be used to signal acceptance of an individual's identity, or in the case of divestiture, support can be withheld or used contingently to motivate change in identity (Ashforth & Mael, 1989; Cushman, 1986; Van Maanen, 1976). Nevertheless, social support is but one element of the investiture/divestiture process and is not always used; thus, it should not be treated as isomorphic with investiture.

Accordingly, as discussed in the Methods section, we also included a new measure of investiture that more closely assesses Van Maanen and Schein's (1979) original conception. The new measure was not designed to be orthogonal to the Jones measure in that it also implies some degree of social support. Hence, we will present parallel analyses for the Jones measure of investiture and for our new measure. These analyses will facilitate compar-

isons of the relative impact of the two measures and comparisons of our results with those reported in other studies using only the Jones measure.

Role Change

Jones (1986) assessed an innovative role orientation with a five-item scale. Unfortunately, the scale mixes *attempts* to change a role, duties, procedures, and so forth (e.g., "I have made an attempt to redefine my role . . ."), with *actual* changes (e.g., "I have changed the mission . . ."). It seems that attempts to change one's role would be less likely to succeed in the kinds of organizational settings that are most conducive to institutionalized socialization than in the kinds of settings most conducive to individualized socialization. Because institutionalized socialization appears to represent a relatively elaborate and formalized program, we would expect it to be used more by bureaucratic organizations (what Mintzberg [1979] termed "machine and professional bureaucracies"). Conversely, because individualized socialization appears to represent a relative lack of structure, we would expect to find it in more organic organizations (Mintzberg's "adhocracies" and "simple structures"). As Mintzberg (1979) argued, organic organizations tend to be more receptive to change attempts than bureaucratic organizations. Thus, the relative success of attempts at role innovation may be partly confounded with the nature of an organization, and hence, the nature of the socialization process. By distinguishing between attempted innovation and actual innovation, researchers can control this confound.

Consequently, as discussed in the Methods section, we replaced Jones's (1986) role orientation measure with separate measures of attempted and actual role innovation.² Because the constructs of attempted and actual role innovation are conceptually distinguishable (although obviously not empirically independent), we used the two measures simultaneously in all relevant analyses.

METHODS

Sample and Procedures

Because a given organization or organizational subunit tends to socialize newcomers in a characteristic way, it was necessary to survey newcomers from a wide variety of organizations to obtain sufficient variance in the socialization tactics (Wanous, 1992). Accordingly, we focused on members of the 1991 and 1992 graduating classes of Concordia University's undergraduate business program.

Respondents were invited to complete three questionnaires, administered (1) during their final semester, before starting new jobs, (2) after four months on the new jobs, and (3) after ten months on the jobs. The data for

² Further, as Allen and Meyer (1990a) noted, one item—"While I am satisfied with my overall job responsibilities, I have altered the procedures for doing my job"—mixes satisfaction with role orientation and thus is ambiguous.

the current study were derived from the second and third questionnaires. Given the lack of consensus on the specific time lines of the transition process (Ashforth, 1989), our choice of measurement points was admittedly arbitrary. Following Brett's (1984) recommendation, we sought to measure the independent variables (socialization tactics) early in the transition (four months), at a point when the socialization process was more or less evident. We sought to measure the dependent variables (newcomer adjustment) later in the transition (ten months), at a point when adjustment had more or less stabilized. The dependent variables were also measured at four months to enable us to assess whether the initial changes at four months differed from the cumulative changes at ten months.

Potential graduates were contacted by telephone during their final semester. Questionnaires were mailed to 783 people who hoped to find new jobs within one year of graduation and who indicated an interest in the study (all did), and to 166 others whom we were unable to contact by phone. Of these 949 people, 600 (63%) returned the questionnaire. We discarded 19 responses because the individuals did not intend to leave jobs they held while in school or planned to return to school. Ultimately, 350 of the 581 remaining people (60%) reported that they had accepted new full-time positions. Informal conversations with our graduates suggested that many simply did not find full-time work (unemployment in the region hovered around 14 percent during the study) and instead continued in jobs they already held, returned to school, accepted part-time or contract work, or became self-employed.

Of the 350 people eligible for the study, 295 (84%) completed the four-month questionnaire (13 graduates [4%] discontinued employment prior to their four-month anniversaries), and 222 (63%) completed the ten-month questionnaire (with 43 more graduates [12%] discontinuing employment prior to their ten-month anniversaries).³ The average age of the 295 respondents was 23.5 years (*s.d.* = 3.0), and 59.9 percent were women. Neither the mean age nor gender of the 295 four-month respondents differed significantly from that of the 222 ten-month respondents; however, both groups were younger ($t = 5.23$, $t = 4.92$, both $p \leq .01$) and had proportionately more women ($\chi^2_1 = 5.77$, $\chi^2_1 = 5.60$, both $p \leq .05$) than the original pool of 949 graduates. Older graduates were probably more likely to remain in existing jobs or become self-employed and thus not participate in the four- and ten-month questionnaires. However, given that gender was not significantly correlated with either age or previous work experience, it is not clear why proportionately more women completed these questionnaires. In any event, since the present study is restricted to data from the four- and ten-month

³ All analyses involving the four-month questionnaire (see below) were conducted using the full sample of 295 and then repeated using the subset of 222 who also completed the ten-month questionnaire. Because the results were substantially the same, only the results for the full sample are presented at four months.

questionnaires, these sample differences are not directly relevant to the analysis.

Respondents entered a wide variety of occupations. Although no occupational category garnered more than 15 percent of these individuals, the most popular included manager and assistant manager, accountant, sales representative, customer service representative, clerk, auditor, administrative assistant, marketing assistant, programmer-analyst, and bank teller. Similarly, respondents entered a wide variety of industries, the most popular of which included banking and financial services, manufacturing, accounting, insurance, retail selling, government services, medical/pharmaceutical products, and wholesaling.

Measures

Socialization tactics. As noted, each of the six tactics was measured by a five-item scale derived from Jones (1986). High scores reflect the institutionalized end of the socialization continuum (as indicated by the label), and low scores reflect the individualized end. According to Jones, each item reflects a separate facet of the content domain for the relevant tactics. Further, items were endowed "with an active, behavioral, rather than an affective, evaluative tone in order to reduce common method variance" (Jones, 1986: 268). Sample items include "This organization puts all newcomers through the same set of learning experiences" (collective); "During my training for this job I was normally physically apart from regular organizational members" (formal); "There is a clear pattern in the way one role leads to another or one job assignment leads to another in this organization" (sequential); "I can predict my future career path in this organization by observing other people's experiences" (fixed); "I am gaining a clear understanding of my role in this organization from observing my senior colleagues" (serial); and "I have had to change my attitudes and values to be accepted in this organization" (investiture, reverse-coded).

It was noted that the study also includes a second measure of investiture designed to better approximate Van Maanen and Schein's (1979) original formulation. The five items are (1) The organization does not try to change the values and beliefs of newcomers, (2) I have learned that certain behaviors and attitudes of mine are not considered acceptable in this organization (reverse-coded), (3) The following statement describes the attitude of my organization toward newcomers: "We like you as you are; don't change," (4) In this organization, you must "pay your dues" before you are fully accepted (reverse-coded), and (5) I have been made to feel that I still have a lot to learn (reverse-coded).

Responses for all socialization measures ranged from 1, disagree strongly, to 7, agree strongly. The measures were included in the four-month questionnaire.

As discussed earlier, Ashforth and colleagues (1995) examined the dimensionality of the socialization measures using the present data. Although the six-factor model (with either the Jones measure of investiture or the one

above) fit the data somewhat better than competing models, the model did not attain conventional levels of adequate fit for structural equation modeling because of the moderate to high correlations among the socialization tactics (see Table 1). However, the fit appeared sufficiently promising, particularly in light of the clearer factor structures obtained in other investigations (Black, 1992; Jones, 1986), to warrant the continued use and refinement of the measures.

Role change and person change. Two measures assessed role change. First, *attempted role innovation* was assessed by a seven-item scale developed for this study. Sample items include "I have made an attempt to expand the autonomy I have at work," "I have made an effort to participate more in decisions that affect my department or work unit," and "I have tried to increase the degree of control that I am permitted to have over my job" (1 = disagree strongly, to 7 = agree strongly). Second, *actual role innovation* was assessed by West's (1987) six-item scale. The instructions for the scale state the following: "Please indicate the ways in which you do your job differently from the person(s) who did the job before you, or from others doing this job in your organization. If you are the *first* person to do the job use the 'Not applicable' response. If you have absolutely no idea how the job has been done, use the 'Don't know' response." Sample items include "Setting work targets/objectives" and "Deciding the methods used to achieve work targets/objectives." Responses range from 1, "I do the job much the same as other people have done it," to 4, "I do the job completely differently than others have done it." "Not applicable" and "don't know" responses were treated as missing data. This treatment resulted in relatively low Ns at both four (224) and ten months (184).

Thus, the attempted role innovation scale and the actual role innovation scale decouple the potential confound inherent in Jones's innovative role orientation measure. To reduce priming effects, the attempted innovation scale focuses on relatively abstract concepts like "autonomy," "participation," and "discretion," whereas the actual innovation scale focuses on specific objects of innovation like "setting work targets." High scores for the two measures reflect an innovative role orientation, and low scores reflect a custodial orientation.

Finally, *person change* was assessed by Nicholson and West's (1988) four-item scale. The instructions state: "Do you think adjusting to your present job has changed *you* in any way?" Sample items include "Values (what is important to me in life)" and "Personality (what sort of person I am)" (1 = no change at all, to 5 = a great deal of change). The role change and person change variables were assessed at both four and ten months.

Indicators of newcomer adjustment. *Role ambiguity* and *role conflict* were measured by Rizzo, House, and Lirtzman's (1970) six- and eight-item scales. *Stress symptoms* were measured by the seven-item physical symptoms scale from Patchen (1970). *Job satisfaction* was assessed by Cammann, Fichman, Jenkins, and Klesh's (1983) three-item scale. *Intentions to quit* were measured by Colarelli's (1984) three-item scale. *Organizational commitment*

TABLE 1
Descriptive Statistics, Reliability Estimates, and Correlations^a

Variables	Range	Mean	s.d.	N	1	2	3	4	5	6	7	8	9
Socialization tactics													
1. Collective	1-7	3.91	1.52	295	(.77)								
2. Formal	1-7	3.44	1.29	295	.66	(.66)							
3. Sequential	1-7	4.43	1.50	295	.63	.69	(.82)						
4. Fixed	1-7	4.25	1.44	295	.55	.62	.78	(.79)					
5. Serial	1-7	4.85	1.42	295	.55	.60	.71	.68	(.77)				
6. Investiture (Jones)	1-7	5.25	1.11	295	.22	.19	.30	.40	.52	(.68)			
7. Investiture (new)	1-7	4.55	1.15	295	.05	-.03	.11	.24	.26	.62	(.66)		
Newcomer adjustment, four months													
Role change and person change													
8. Attempted role innovation	1-7	4.64	1.08	294	-.24	-.29	-.23	-.20	-.22	-.06	-.09	(.80)	
9. Actual role innovation	1-4	1.90	0.77	224	-.22	-.23	-.23	-.17	-.25	-.02	.01	.37	(.90)
10. Person change	1-5	2.40	0.83	295	.05	.00	-.09	-.10	-.13	-.17	-.23	.04	.11
Indicators of adjustment													
11. Role ambiguity	1-7	2.60	1.08	295	-.24	-.17	-.38	-.41	-.44	-.41	-.34	.05	.04
12. Role conflict	1-7	3.24	1.12	295	-.24	-.17	-.25	-.31	-.40	-.42	-.38	.19	.12
13. Stress symptoms	1-6	2.81	0.93	295	.01	-.02	-.09	-.20	-.18	-.28	-.29	-.02	-.08
14. Job satisfaction	1-7	5.05	1.77	295	.22	.29	.40	.44	.46	.54	.37	-.05	-.05
15. Intentions to quit	1-7	3.22	1.94	295	-.26	-.39	-.47	-.46	-.51	-.44	-.27	.17	.17
16. Organizational commitment	1-7	3.85	0.99	295	.19	.18	.18	.22	.25	.26	.22	.05	-.06
17. Organizational identification	1-7	4.57	1.21	295	.22	.25	.29	.35	.31	.38	.16	.03	-.07
18. Performance	1-9	7.21	0.99	294	-.07	-.16	.02	.00	-.03	.21	.26	.31	.17
Newcomer adjustment, ten months													
Role change and person change													
19. Attempted role innovation	1-7	5.13	1.03	221	-.15	-.12	-.07	-.08	-.02	.02	-.02	.55	.24
20. Actual role innovation	1-4	2.05	0.75	184	-.27	-.18	-.26	-.13	-.26	.00	.00	.44	.61
21. Person change	1-5	2.49	0.85	221	.09	.08	.04	.03	.03	-.08	-.21	-.11	.02
Indicators of adjustment													
22. Role ambiguity	1-7	2.49	1.03	222	-.14	-.14	-.27	-.26	-.34	-.27	-.27	-.05	-.02
23. Role conflict	1-7	3.40	1.13	222	-.10	-.10	-.21	-.24	-.35	-.37	-.37	.20	.16
24. Stress symptoms	1-6	2.87	0.88	222	.05	.04	.01	-.09	-.07	-.22	-.20	-.08	-.04
25. Job satisfaction	1-7	5.06	1.71	222	.07	.16	.25	.29	.27	.41	.32	.06	-.02
26. Intentions to quit	1-7	3.53	1.86	222	-.17	-.28	-.31	-.34	-.28	-.32	-.21	.04	.11
27. Organizational commitment	1-7	3.66	0.98	222	.05	.13	.09	.14	.10	.16	.21	.10	-.08
28. Organizational identification	1-7	4.53	1.35	222	.11	.20	.22	.29	.21	.32	.23	.09	-.01
29. Performance	1-9	7.35	0.95	221	-.08	-.12	.00	.00	-.01	.18	.20	.29	.15

^a Reliability estimates (Cronbach alpha) are indicated along the diagonal. N for a correlation is the lower N of the pair. If N = 184, $r \geq .15$ is significant at $p \leq .05$; if N = 221-224, $r \geq .13$ is significant at $p \leq .05$; if N = 294-295, $r \geq .12$ is significant at $p \leq .05$. All tests of significance are two-tailed.

was assessed by the eight-item normative commitment subscale from Allen and Meyer (1990b). This measurement was selected because Meyer and Allen (1991) maintained that normative commitment develops partly from the normative pressures exerted on an individual during socialization. *Organizational identification* was measured by Mael's (1988; Mael & Ashforth, 1992) six-item scale. Responses for all but stress symptoms range from 1, disagree strongly, to 7, agree strongly. The responses for stress symptoms range from 1 through 6, with the specific anchors depending on the symptom (e.g., "Trouble getting to sleep," 1 = almost never, 6 = several times a week).

Finally, *performance* was assessed by R. J. House's (in Smith [1982]) six-item self-appraisal scale. Sample items include "Quality of work," "Amount of effort," and "Ability to work effectively with others." A reliance on self-report measures is potentially problematic for the construct of performance in particular since this construct is prone to self-serving biases. Indeed, the mean rating in the present study on a nine-point response scale was 7.21 (s.d. = 0.99, where 1 = very low, 5 = about average, 7 = above average, and 9 = very high) at four months, and 7.35 (s.d. = 0.95) at ten months (see Table 1).⁴ However, on the basis of a meta-analysis, Harris and Schaubroeck (1988) concluded that self-ratings of performance are moderately correlated with both supervisor ratings and peer ratings.

All indicators of newcomer adjustment were assessed at four and ten months. Table 1 presents the means, standard deviations, response ranges, reliabilities (Cronbach alphas), and intercorrelations of all the measures.

Analyses

Role change and person change. Given the six moderately intercorrelated socialization tactics and the moderate correlation between two of the three change variables (attempted and actual role innovation), a method that reveals the relationships prevailing among the two sets of variables was desired. Thus, following Jones (1986) and Baker (1989), we used canonical correlation analyses to examine these relationships.

Canonical correlation analysis derives a linear combination (or combinations) or canonical variate (or variates) from each of two sets of variables to maximize the correlation between the two sets. Consequently, this analysis accommodates potential redundancies among the two sets of variables. Further, canonical analysis provides a more parsimonious set of results (2 time points \times 2 versions of the socialization measure [one with the Jones measure of investiture, and one with the new measure] = 4 analyses) than does regression analysis (3 outcomes \times 2 time points \times 2 versions of socialization = 12 analyses). However, as described later, we conducted certain post hoc regres-

⁴ Although the relatively high means suggest a negatively skewed scale, very few people rated themselves below 5, and the scale was more or less normally distributed within the 5 to 9 range. Thus, a transformation of the data resulted in negligible differences.

sion analyses to clarify some of the findings. The canonical correlation analyses were conducted for both the four- and ten-month measurement points.

Indicators of newcomer adjustment. Again, given the six moderately intercorrelated socialization tactics and the eight moderately intercorrelated outcome variables, canonical correlation analysis was used. This analysis was far more parsimonious than regression analysis (4 canonical analyses vs. 32 regression analyses [8 outcomes \times 2 time points \times 2 versions of socialization]). However, we performed certain post hoc regressions to clarify ambiguous findings. The canonical correlation analyses were again conducted for both the four- and ten-month questionnaires.

RESULTS

Role Change and Person Change

Hypothesis 1 maintains that the tactics that reflect institutionalized socialization will be negatively associated with role innovation. Hypothesis 2a holds that the tactic of investiture will be negatively associated with person change, and Hypothesis 2b, that the other institutionalized socialization tactics will be positively associated with person change. Table 2 presents the results of the canonical correlation analysis. The upper set of results include the Jones measure of investiture, and the lower set includes the new measure. Regardless of the measure of investiture used, we obtained two significant variates for the four-month point and one for the ten-month point.

Following Tabachnick and Fidell (1983), we consider only those canonical loadings (i.e., correlations between variables and canonical variates) of $\pm .30$ or greater. For the four-month point (for both versions of the socialization measures), the first canonical variate reflects institutionalized socialization, as five of the six tactics loaded positively (investiture was not significant). Attempted and actual role innovation dominated this variate, and both loaded negatively. The second canonical variate reflects individualized socialization, as four of the six tactics loaded negatively (collective and formal were not significant) when the Jones measure of investiture was included; however, only the serial and investiture tactics were significant when the new measure of investiture was included. Person change dominated this variate and loaded positively.

For the ten-month point, the lone variate reflects institutionalized socialization and, again, all but investiture loaded positively. The variate was dominated by actual role innovation, which loaded negatively. Person change loaded positively, albeit marginally (.30).

Thus, except for investiture, the tactics reflecting institutionalized socialization were negatively related to both attempted and actual role innovation at four months and to actual role innovation at ten months. This pattern provides some support for Hypothesis 1. However, with regard to Hypotheses 2a and 2b, the socialization tactics were related to person change differently at four months and ten months. This is because the lone variate at ten months was dominated by actual role innovation, consequently obscuring

TABLE 2
Canonical Correlations Between the Socialization Tactics and Indicators of Role and Person Change

Variables	Canonical Loadings ^a		
	At Four Months		At Ten Months
	Variate 1	Variate 2	Variate 1
With Jones measure of investiture			
Socialization tactics			
Collective	.79	.13	.72
Formal	.87	-.08	.46
Sequential	.74	-.44	.70
Fixed	.57	-.45	.33
Serial	.70	-.64	.69
Investiture	-.01	-.78	-.04
Role and person change			
Attempted role innovation	-.83	.16	-.27
Actual role innovation	-.79	.20	-.94
Person change	.14	.99	.30
Canonical correlation	.37	.29	.39
Canonical root	.14	.08	.15
Wilks's lambda	.78	.90	.82
F	3.16***	2.32*	2.03**
With new measure of investiture			
Socialization tactics			
Collective	.79	.27	.75
Formal	.91	.10	.47
Sequential	.82	-.25	.71
Fixed	.65	-.29	.34
Serial	.80	-.44	.69
Investiture	-.02	-.79	-.23
Role and person change			
Attempted role innovation	-.87	.02	-.26
Actual role innovation	-.78	.06	-.91
Person change	-.02	.99	.38
Canonical correlation	.36	.32	.38
Canonical root	.13	.10	.14
Wilks's lambda	.77	.89	.79
F	3.19***	2.66**	2.38***

^a All signs for variate 2 at four months with the Jones measure of investiture and for variate 1 at four months with the new measure of investiture are reversed to permit direct comparisons with the other loadings.

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

the association between the tactics and person change. To help clarify the findings, we regressed person change on the tactics at four and ten months. This post hoc analysis revealed that, consistent with Hypothesis 2a, investiture was negatively related to person change at four months ($\beta = -.18$, $p \leq .05$, Jones measure; $\beta = -.21$, $p \leq .01$, new measure) and at ten months

(but only for the new measure: $\beta = -.25$, $p \leq .001$; for the Jones measure, $\beta = -.16$, n.s.). However, of the five remaining institutionalized tactics predicted (Hypothesis 2b) to be positively related to person change, only collective was significant (at four months only: $\beta = .22$, $p \leq .05$, with either investiture measure).

Indicators of Newcomer Adjustment

Hypotheses 3 and 4 posit associations between institutionalized socialization tactics and newcomer adjustment. Table 3 presents the results of the canonical correlation analysis between the six socialization tactics and the eight indicators of adjustment. Again, note that the upper set of results includes the Jones measure of investiture, and the lower set includes the new measure. For each of the four analyses (2 time points \times 2 versions of the socialization measures), a maximum of two significant variates is presented because later variates explained very little variance and were difficult to interpret.

For the four-month measurement point (for both versions of the socialization measures), the first canonical variate reflects institutionalized socialization, as all six tactics loaded positively. Consistent with Hypothesis 3, role ambiguity, role conflict, and stress symptoms loaded negatively. Consistent with Hypothesis 4, job satisfaction, organizational commitment, and organizational identification loaded positively, and intentions to quit loaded negatively. The second canonical variate reflects individualized socialization, as five of the six tactics loaded negatively (investiture loaded positively). In support of Hypotheses 5a and 5b, performance loaded positively. The loading for intentions to quit, now positive, was again significant. However, stress symptoms loaded negatively.

The results for the ten-month point were virtually the same. For both versions of the socialization tactics, the first canonical variate reflected institutionalized socialization, as all six tactics loaded positively. Consistent with Hypotheses 3 and 4, role ambiguity, role conflict, stress symptoms (for the Jones version only), and intentions to quit loaded negatively, and job satisfaction, organizational commitment, and organizational identification loaded positively. The second canonical variate reflects individualized socialization (except that investiture loaded positively). In support of Hypotheses 5a and 5b, performance loaded positively. Intentions to quit (for the new version only) loaded positively, and stress symptoms loaded negatively.

Thus, the tactics representing institutionalized socialization were associated with lower levels of the stressors and stress symptoms and with greater job and organizational attachment and greater organizational identification. Further, the tactics representing individualized socialization appeared to be associated with stronger performance and intentions to quit but, unexpectedly, with lower levels of stress symptoms. A post hoc regression of stress symptoms on the socialization tactics revealed that the negative loading for stress symptoms was largely attributable to investiture (vs. divestiture) (four months: $\beta = -.21$, $p \leq .01$, Jones measure; $\beta = -.21$, $p \leq .001$, new measure;

TABLE 3
Canonical Correlations Between the Socialization Tactics and Indicators
of Newcomer Adjustment

Variables	Canonical Loadings			
	At Four Months		At Ten Months	
	Variate 1	Variate 2	Variate 1	Variate 2
With Jones measure of investiture				
Socialization tactics				
Collective	.44	-.42	.30	-.65
Formal	.45	-.77	.40	-.80
Sequential	.69	-.51	.63	-.64
Fixed	.76	-.31	.71	-.45
Serial	.82	-.44	.78	-.46
Investiture	.86	.38	.90	.35
Newcomer adjustment				
Role ambiguity	-.73	-.04	-.61	.18
Role conflict	-.66	-.10	-.72	-.11
Stress symptoms	-.40	-.31	-.34	-.45
Job satisfaction	.84	.04	.77	.16
Intentions to quit	-.79	.38	-.69	.24
Organizational commitment	.40	-.06	.30	-.02
Organizational identification	.59	-.01	.62	.00
Performance	.19	.67	.23	.54
Canonical correlation	.72	.41	.56	.37
Canonical root	.51	.16	.32	.14
Wilks's lambda	.34	.70	.53	.78
F	6.99***	2.95***	2.93***	1.55*
With new measure of investiture ^a				
Socialization tactics				
Collective	.44	-.41	.30	-.64
Formal	.44	-.76	.39	-.85
Sequential	.69	-.52	.62	-.66
Fixed	.76	-.37	.68	-.50
Serial	.84	-.41	.78	-.38
Investiture	.69	.63	.73	.53
Newcomer adjustment				
Role ambiguity	-.76	-.06	-.68	.02
Role conflict	-.69	-.15	-.78	-.27
Stress symptoms	-.41	-.30	-.29	-.38
Job satisfaction	.78	-.09	.71	.03
Intentions to quit	-.76	.43	-.62	.40
Organizational commitment	.41	-.02	.36	.00
Organizational identification	.47	-.27	.55	-.18
Performance	.19	.63	.22	.51
Canonical correlation	.71	.43	.58	.36
Canonical root	.50	.19	.33	.13
Wilks's lambda	.35	.69	.53	.79
F	6.88***	3.08***	2.93***	1.42*

^a All signs for the ten-month loadings are reversed to permit direct comparisons with the other loadings.

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

ten months: $\beta = -.22$, $p \leq .01$, Jones measure; $\beta = -.15$, $p \leq .05$, new measure). Finally, investiture/divestiture loaded in a manner opposite to that of the other individualized tactics not only because of the negative association between investiture and the stress symptoms, but also because of a positive association between investiture and performance (four months: $\beta = .29$, $p \leq .001$, Jones measure; $\beta = .26$, $p \leq .001$, new measure; ten months: $\beta = .24$, $p \leq .01$, Jones measure; $\beta = .20$, $p \leq .01$, new measure). As Hypotheses 3 and 5a suggest, the affirmation of an individual's incoming self reduces stress and facilitates self-appraised performance.

DISCUSSION

In the following pages, we discuss (1) the degree to which the findings supported our hypotheses regarding newcomer adjustment, (2) the validity of our refinements to the measures of investiture and role innovation, and (3) the limitations of the study.

Newcomer Adjustment

Role change and person change. In support of Hypothesis 1, the canonical correlation analyses indicate that five of the six tactics representing institutionalized socialization—collective, formal, sequential, fixed, and serial—were negatively related to both attempted and actual role innovation at four months and to actual role innovation at ten months. This negative relationship accords with the argument that institutionalized socialization induces newcomers to conform to established goals and methods and thereby maintain the status quo.

Consistent with Hypothesis 2a, investiture was negatively related to person change at four months (using either investiture measure) and at ten months (with the new measure only). Socialization practices that endorse a newcomer's incoming identity and attributes are less likely to provoke person change than practices that question the newcomer. Of the remaining institutionalized socialization tactics predicted (Hypothesis 2b) to be positively related to person change, only collective socialization was significant. Perhaps it should not be surprising that collective socialization exerted a relatively strong impact. The group dynamics literature suggests that an individual's reference group often exerts a far more potent influence on him or her than the more psychologically distant organization (e.g., Barker, 1993). Collective socialization encourages the newcomer to internalize and conform to emergent group norms, provoking changes in attitudes, beliefs, and even personality.

Indicators of newcomer adjustment. In support of Hypotheses 3 and 4, the canonical correlation analyses also indicate that the six tactics of institutionalized socialization were negatively related to role ambiguity, role conflict, stress symptoms, and intentions to quit and positively associated with job satisfaction, organizational commitment, and organizational identification at both four months and (with the exception of stress symptoms for the new measure of investiture) ten months. These results provide a

longitudinal extension of largely cross-sectional prior research and include two outcomes not previously assessed vis-à-vis socialization tactics: stress symptoms and organizational identification.

It thus appears that, consistent with the theorizing of both Van Maanen and Schein (1979) and Jones (1986), the collective, formal, sequential, fixed, serial, and investiture tactics reduce the uncertainty (role ambiguity, role conflict) and anxiety (stress symptoms) that impair newcomer adjustment, producing both affective and cognitive attachments to a job and an organization (job satisfaction, organizational commitment and identification, reduced intentions to quit). The inclusion of organizational identification is particularly noteworthy because it suggests that institutionalized socialization induces newcomers to *define* themselves in terms of their organizational membership, binding their self-conceptions with the perceived identity of the organization (Ashforth & Mael, 1989). Hence, socialization has pervasive effects, spanning adjustment to the immediate job and the larger organization.

Consistent with Hypotheses 5a and 5b, the canonical correlation analyses also reveal that the tactics reflecting individualized socialization (with one tactic, investiture, loading in a manner opposite to that predicted by Jones) were positively associated with performance at both four months and ten months. As argued earlier, institutionalized socialization may erect normative constraints on achievement, whereas individualized socialization may reduce such constraints. However, for newcomers who are presumably less inclined than the current sample of business school graduates to view work as a central life interest, this relative lack of normative constraint may result in poorer performance; and for organizations with relatively unique identities, investiture may impair performance. Clearly, future research should further assess the relationship between socialization and performance in other samples.

Are there implicit trade-offs? These results seem to suggest that there are certain trade-offs to be addressed in the selection of socialization tactics. On the other hand, institutionalized socialization appears to promote attachment to a job and organization, thus promoting a more loyal workforce; on the other hand, individualized socialization appears to promote role innovation and superior performance, or at least it did so among the present sample (cf. Baker, 1989; Jones, 1986).

However, *description* is not the same as *prescription*. We believe that this trade-off between institutionalized and individualized socialization is more apparent than real; that is, institutionalized socialization need not necessarily be associated with a less innovative and poorer performing workforce (cf. Nemeth & Staw, 1989). Whether a given socialization tactic results in high or low role innovation and performance depends on what is learned, not on how it is taught.⁵ For example, as noted, Van Maanen and Schein (1979) argued that a fixed timetable for assumption of a work role may convey

⁵ We thank a reviewer for raising this issue.

a sense of security that enables a newcomer to innovate, whereas Jones (1986) argued that a fixed timetable may convey a desire not to take any risks. Thus, the tactics reflect a set of processes, not a set of contents to be learned (cf. Chao, O'Leary-Kelly, Wolf, Klein, & Gardner, 1994). Similarly, Schein (1970) suggested that socialization can foster "creative individualism," where an individual adheres to pivotal organizational values and goals but exercises freedom and creativity in realizing those values and goals.

We speculate that socialization processes can indeed be used to impart a wide variety of content. Ostroff and Kozlowski (1992) found that newcomers from a broad range of organizations relied heavily upon observation and interaction with co-workers and supervisors to learn about their tasks, roles, work groups, and organizations. Insofar as observation and interaction imply institutionalized socialization (via the serial tactic), this finding attests to the potential versatility of institutionalized socialization in transmitting technical knowledge, role expectations, work group norms, political realities, organizational values, and so on. Given this versatility, institutionalized socialization may carry the potential to impart and reinforce norms of either ordinary or extraordinary innovativeness and performance. For example, as mentioned, Black (1992) found that because expatriate managers were predisposed to innovate, a collective socialization process reinforced this predisposition.

Admittedly, however, the weight of history suggests that organizations and their subgroups (as manifested, in particular, through collective and serial socialization) tend to settle more frequently for the ordinary than the extraordinary—perhaps because of concerns regarding egalitarianism, solidarity, and comfort. Thus, a critical issue for future research is how organizations might reap the benefits that tend to be associated with both institutionalized and individualized socialization without one compromising the other.

Dynamics of socialization over time. A comparison of the associations between the socialization tactics and the hypothesized outcomes at four months and ten months yields two interesting findings. First, as evidenced by the zero-order and canonical correlation matrixes (Tables 1–3), the pattern of associations between the tactics and outcomes was relatively stable over time. This is consistent with Bauer and Green's (1994) finding that the adjustment perceptions of doctoral students assessed in the first three weeks after entry into doctoral programs strongly predicted perceptions assessed almost one year later. As Bauer and Green argued, this stability in perceptions suggests that pre-entry experiences and early encounters may strongly affect newcomer responses, so that basic adjustment occurs much more rapidly than anticipated by various socialization models.

Second, despite this stability, the impact of the tactics was somewhat stronger at four months than at ten months. This result may reflect priming effects caused by assessing both socialization and the outcomes at four months, and it may reflect the common finding that the power of a predictor decreases as the lag between it and a criterion increases (e.g., Cohen, 1993).

However, as argued earlier, the notion of stage models of socialization (e.g., Feldman, 1976; Katz, 1980; Porter et al., 1975) suggests that the reduced impact of the socialization tactics over time may also reflect real changes in socialization dynamics during individuals' early careers. By structuring early work experiences and influencing the inferences that are drawn from those experiences, the institutionalized practices help combat the initial reality shock and uncertainty that newcomers often encounter. Thus, it is not surprising that institutionalized socialization was associated with affective and cognitive attachment to the organization after four months.

However, as newcomers begin to develop a more stable sense of their roles and what is expected of them, other desires, such as for challenge and growth, may emerge (Katz, 1980). Accordingly, many newcomers may become less responsive to institutionalized socialization and more responsive to other stimuli in the workplace. Indeed, the welcome security that institutionalized socialization initially represented may come to represent smothering paternalism. Therefore, the very success of institutionalized socialization at four months may be one reason it was less strongly associated with attachment at ten months.

Refinements of the Measures

Investiture. The study included a new measure of investiture that was argued to reflect Van Maanen and Schein's (1979) original definition of investiture more accurately than does Jones's (1986) measure. The new measure focuses on the confirmation of a newcomer's existing attributes, whereas Jones's measure focuses on social support for the newcomer and for his or her attributes. The data provide some evidence of both convergent and discriminant validity and concurrent and predictive validity. First, as noted, our measure was not intended to be orthogonal to Jones's measure, since our measure implies some social support. Thus, one would anticipate that our measure would be more strongly related to Jones's measure of investiture than to his measures of the other tactics (convergent validity) but would not be isomorphic with the former (only moderately related, showing discriminant validity). As Table 1 shows, both were true: the correlations between our investiture measure and the measures of the other tactics ranged from $-.03$ to $.26$, and the correlation between our measure and Jones's investiture measure was $.62$. Second, with the exception of role innovation, our measure of investiture was typically related as hypothesized to the outcomes at both four months (concurrent validity) and ten months (predictive validity). Moreover, our measure was related to both person change and performance in a manner opposite to that of the other institutionalized socialization tactics, providing further evidence of discriminant validity.

We recognize, however, that one study is not definitive. Thus, we advocate continued research on the nuances of investiture and its measurement. Additionally, Table 1 shows that where both the new version and Jones's version of investiture are significantly correlated with an outcome, the direction (positive or negative) is identical, although the magnitude tends to be

greater for Jones's measure. This pattern suggests the utility of including both the new measure of investiture, with its greater fidelity to Van Maanen and Schein's (1979) definition, and a measure of the *social support* conferred during socialization.

Role change. We contended that Jones's (1986) measure of innovative role orientation confounded attempted role innovation with actual role innovation. Although institutionalized socialization was negatively associated with both attempted and actual role innovation, one critical finding underscores the importance of maintaining a distinction between the two in socialization research. At four months, the socialization tactics explained 9 percent of the variance in attempted role innovation and 8–9 percent of the variance in actual role innovation (depending on which measure of investiture was used). However, at ten months, the socialization tactics explained only 3 percent of the variance in attempted role innovation and 12–13 percent of the variance in actual role innovation. This result indicates, not surprisingly, that the impact of socialization on actual role innovation lags behind the impact of socialization on attempts at role innovation.

Limitations

Certain limitations of the study should be kept in mind when interpreting the results. One limitation is our exclusive reliance on self-report measures. This reliance raises questions about common method bias and the accuracy of respondents' perceptions and their willingness to respond honestly. The use of separate four- and ten-month questionnaires likely reduced method variance and the reliance on recall (Podsakoff & Organ, 1986). Moreover, as Bauer and Green (1994) noted, it seems appropriate that newcomers should assess the adjustment variables since the process of adjustment pertains to their perceptions, intentions, and responses. Nevertheless, future research should supplement self-report measures with data from alternate sources, such as peers, supervisors, and documents (Wanous & Colella, 1989). This would be particularly helpful for constructs that are more or less verifiable and that are critical from an organization's point of view, such as the socialization tactics and certain indexes of adjustment, including organization-newcomer fit, performance, and absenteeism.

A second limitation is that the sample is homogeneous in certain respects. Although our respondents entered a variety of occupations and industries, they were all recent graduates of the same business school and were generally in their early twenties. As suggested at several points in the article, these attributes may have influenced their aspirations and perceptions, as well as how their employers opted to socialize them. Thus, the generalizability of our findings should be assessed by including more diverse samples of newcomers.

A third limitation concerns the relatively low reliabilities of several socialization tactics (see Table 1). Indeed, the reported reliabilities of the tactics have varied widely across studies using Jones's (1986) measures (cf. Allen & Meyer, 1990a; Baker & Feldman, 1990; Baker, 1989; Black,

1992; Jones, 1986). A comparison of these studies yields three suggestions for improving the reliability of the measures. First, given that Jones wrote each item to tap a separate aspect of the relevant content domain, there is minimal redundancy among the items. Consequently, researchers should refrain from shortening the scales unless a particular item is known to be inapplicable to the sample of interest. Second, researchers should avoid revising individual items unless they have a clear sense of the relevant content domain and the nomological links between the items within a domain. Not surprisingly, the poorest reliabilities were obtained by Baker and Feldman (1990) and Black (1992), both of whom used shortened or revised measures. Nevertheless, in the three studies using the full and original set of Jones's items (the current study, Allen and Meyer [1990a], and Jones [1986]), the reliability of several tactics has remained problematic: for formal socialization, it ranges from .62 to .68; for collective, from .70 to .84, and for investiture, from .68 to .79 (new measure, .66). Thus, we recommend that additional items be written (or rewritten), perhaps by carving the content domain of each tactic into finer slices. Further, as suggested above, newcomers' assessments of the tactics should be validated against the assessments of other organizational members and against more qualitative indexes (e.g., participant or nonparticipant observation, policies, and other documentation).

CONCLUSION

The present study provides further evidence of the pervasive impact of organizational socialization on newcomer adjustment. More specifically, we extended previous research on Van Maanen and Schein's (1979) typology of socialization tactics. We found that the tactics reflecting a relatively structured approach to socialization—what Jones (1986) referred to as institutionalized socialization—were associated both cross-sectionally and longitudinally with lower role ambiguity, role conflict, stress symptoms, and intentions to quit and with higher job satisfaction, organizational commitment, and organizational identification. Although institutionalized socialization was also associated with lower role innovation and self-appraised performance, we argued that institutionalized socialization need not produce such drawbacks. Further, the pattern of associations between the tactics and newcomer adjustment variables was relatively stable over time, although the magnitude of the associations was somewhat lessened. Finally, we proposed and assessed refinements to Jones's (1986) measures of role change and the tactic of investiture.

In addition to the specific research issues already discussed, the study suggests three general issues for future research. One issue concerns the time lines of socialization. Socialization is fundamentally a process. However, as noted, stage models of socialization typically provide only vague guidelines regarding the onset and duration of various stages (Nelson, 1987). This lack is due, in part, to the wide variance in socialization trajectories across newcomers, occupations, and organizations (e.g., Reichers, 1987). Further, this

vagueness in time lines is common to theories of work adjustment processes (Ashforth, 1989). Unfortunately, this vagueness creates uncertainty regarding when to assess socialization dynamics, how often they should be assessed, and how long the lags between assessments should be. Thus, future research, coupled with more rigorous theorizing on the factors that moderate and mediate socialization trajectories, should attempt to specify more precisely the time lines involved in socialization processes.

Second, in focusing on organizations' use of socialization tactics, the study represents a largely situational approach to the socialization process. However, recent research suggests that newcomers are proactive agents in their own socialization (Mignerey et al., 1995; Miller & Jablin, 1991; Morrison, 1993; Ostroff & Kozlowski, 1992). In particular, newcomer information seeking has been found to be related to newcomer adjustment. Therefore, future research might integrate the socialization tactics with the information-seeking approach, as the extent to which newcomers are information seekers may depend in part on an organization's selection of tactics. For example, collective and serial tactics are particularly likely to provide newcomers with access to important sources of information and opportunities to practice information-seeking behavior.

Finally, future research should focus on the context in which socialization occurs (Cappelli & Sherer, 1991). Socialization, like any process, is interpenetrated with—and thus reflects—the specific setting and circumstances in which it unfolds. Yet most conceptual and quantitative empirical work on socialization effectively ignores macro factors, such as the size, structure, mission, and culture of the studied organization (or relevant subunit) and the occupation, and meso factors—such as intergroup dynamics, leadership styles, technology and job design, and reward and communication systems—as well as wider societal concerns, such as the availability of jobs and changing trends in the career preferences of young adults. Relatedly, future research should explore how socialization processes and content differ across various types of organizational role transitions, such as entry, promotion, and domestic and international job transfers (e.g., Black, 1992; Kramer, 1993). Hence, future research, again coupled with more rigorous theorizing, should attempt to specify a truly *organizational* theory of socialization processes.

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RESEARCH NOTES

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EFFECTS OF INTERNATIONAL DIVERSITY AND PRODUCT DIVERSITY ON THE PERFORMANCE OF MULTINATIONAL FIRMS

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This study examined the relationships among international diversity, product diversity, and firm performance. For a sample of large American industrial multinational enterprises (MNEs), it showed a consistent quadratic relationship between product diversification and MNE performance but minimal performance differences across different measures of international diversity. Analysis of the interactions of international diversity and product diversity indicates a weak effect from increasing internationalization on the performance effect of product diversity.

Companies have been engaged in efforts to diversify (or to refocus) their product offerings and their geographical markets for many years. Researchers have been engaged in the organized analysis of diversification strategies and their effects on firms' performance levels for almost as long, certainly since Chandler's *Strategy and Structure* was published in 1962. Conceptually, diversification makes sense and should be profitable, up to a limit. Resource-based theory (Barney, 1991) and core competency theory (Prahalad & Hamel, 1990), which locate competitive advantage with the internal capabilities of a firm, suggest that diversification into products that use the existing "rent-yielding"¹ resources of the firm will generate economies of scope in the use of these resources and therefore will yield greater profitability. However, transaction cost theory suggests that excessive growth will eventually raise governance costs and reduce profits (Jones & Hill, 1988).

Although resource-based models have not been applied widely to multinational firms, leverage and economies of scope and scale in their resource applications across national markets should enable multinationals to improve their returns on resource investments while reducing the variance of their cash flows (Kim, Hwang, & Burgers, 1993). Although external influences

¹ Rent-yielding resources are those assets of a firm that can earn profits above a fair market return (generate economic rents) because of their scarcity value.

are more varied than in the case of product proliferation in a single market, gradual expansion through related markets or marketing of global products (Levitt, 1983) can reduce external uncertainties. In this way, geographical diversification is conceptually similar to engaging in related product diversification to generate profits. Indeed, Fladmoe-Lindquist and Tallman (1994) proposed that the major models of the multinational firm can be seen as quite compatible with resource-based theory. Transaction cost models of the multinational firm do not generally suggest limits on internalization.

The results of extensive empirical analysis of both product and geographical diversification effects on performance are inconclusive and contradictory, as Datta, Rajagopalan, and Rasheed (1991), Grant, Jammine, and Thomas (1988), and Grant (1987) have discussed at length. Therefore, continued efforts in this direction appear to be useful. This study examined the performance effects of different degrees of product diversity and international geographic diversity on the part of American multinational manufacturing firms. First, we tested whether the relationship of performance to degree of product diversity is linear or curvilinear, an issue left unclear in the literature. Next, we examined the effect of different measures of international diversity on performance, again a relationship that has been tested with a variety of results. Finally, we pursued the interactive effects of product and international diversity on firm performance to determine if the scale and scope of international diversity moderate the performance effects of product diversity. The results of the empirical study suggest that the many studies that have focused on a single aspect of diversification have made an unjustified assumption of homogeneity in other directions.

THE DIVERSIFICATION LITERATURE

Although the existing literature on diversification is perhaps one of the largest bodies of work in business strategy, findings have been contradictory. Several articles provide extensive reviews of this literature (e.g., Datta et al., 1991; Grant, 1987; Grant et al., 1988). We summarize their findings, concentrating on those articles that specifically address the key issues addressed in this article.

It seems fair to say that the performance effects of product diversity are not clear. Datta and colleagues (1991) distinguished among degree, type, and mode of diversification. Early studies based on Standard Industrial Classification (SIC) categories found no significant performance effects from *degree* of diversification (Palepu, 1985). Rumelt's (1974) seminal study of qualitative *types* of diversification found differences across his relatedness categories, but subsequent studies using his methodology (e.g., Christensen & Montgomery, 1981) have both confirmed and disputed his findings and have proposed different intervening variables, such as industry identification or firm size, to explain them. Recently, more sophisticated SIC-based continuous measures of degree of diversity have found that moderate degrees of diversity predict higher performance. Hoskisson, Hitt, Johnson, and Moesel (1993) showed that a typology variable and an SIC code-based entropy variable both had high loadings on a single latent variable that, in turn, was negatively

and significantly related to accounting-measure-based performance. Thus, better measures suggest that type and degree of product diversification are closely related. Perhaps the most common finding is that related diversification seems to predict superior growth in performance measures (cf. Datta et al., 1991). Results favoring dominant or related diversification are intuitively appealing because they support the concept that core resources can be "leveraged" across related businesses and generate competitive advantage through scope effects. Unfortunately, other work has shown either no performance effect of related diversification or shown that firms with either single-business or unrelated-diversified strategies outperform related diversifiers (Lubatkin, 1987; Michel & Shaked, 1984; also see summaries in Grant et al. [1988] and Datta et al. [1991]). These discrepancies may result from unlike measures or methods or from underlying nonlinearities in the performance-diversification relationship.

Geographical diversification has also been tested a number of times with conflicting results (cf. Grant, 1987). Grant suggested that multinationalism itself should confer advantage over nonmultinational firms. The theory of the multinational suggests that multinational firms have opportunities to gain greater returns to intangible resources, to use market power, to spread their market risks, and to seek less expensive inputs and less price-sensitive markets (Kim, Hwang, & Burgers, 1993). They can arbitrage across factor markets and leverage their market power to both reduce input costs and control output markets (Kogut, 1985). International diversification (defined in different ways) has generally been found to improve operating performance, though when variables such as firm size, national identity, and industry characteristics are introduced as controls, its significance is reduced (Grant, 1987). Ramaswamy (1993) found that two measures of international diversity interacted to produce significant performance results. However, this is not always the case (Michel & Shaked, 1986; Siddharthan & Lall, 1982). Market returns show both positive and negative relationships to multinationality, although multinationals seem to have lower levels of risk. Inconsistent results are not surprising as the different measures used to describe geographical diversification are not necessarily related to each other (Cosset & Nguyen, 1991). Evidence suggests that firms with significant performance advantages tend to be multinationals but that the direction of the causal relationship may well run from high levels of firm-specific capabilities to higher performance to international diversification, rather than from capabilities to multinationality to higher performance.

Studies of Combined Product and Market Diversification

A small number of existing studies examine the combined effects of product and geographical diversification. Geringer, Beamish, and da Costa (1989) showed that high geographical diversification, measured as the ratio of sales by foreign subsidiaries to total sales, can be a significant predictor of superior performance but that this positive correlation may reverse at very high levels of diversification, probably as a result of excessive management

costs. They also found that dominant and related-product diversification types improve performance over single-product and unrelated diversification types, but they found no significant joint effects.

Grant and colleagues (1988) reported on a test of separate multinational and product diversification effects on performance for a group of British manufacturing firms. They found that an accounting measure of performance was explained by a Herfindahl-type continuous measure of product diversification in a quadratic function. This outcome suggests that intermediate degrees of product diversification increase performance, but higher levels of product diversification result in falling performance. Multinational diversification, measured by a ratio of sales from operations outside a home country to total sales, showed a linear positive effect on performance level. A Rumelt-type typology of diversification was found to be nonsignificant. These authors did not test for joint effects.

Two other studies have examined the effects of international diversification on the relationship between product diversification and performance. Franko (1989) found that for a sample of internationally diversified global firms, unrelated product diversification was negatively related to performance. Of course, this result is much the same as those for nonmultinational firms. Kim, Hwang, and Burgers (1989) demonstrated that the impact of different degrees of corporate diversification, measured by an entropy measure of relative sales, on corporate profit performance was contingent on the degree of multinationalization, measured by foreign employee ratio.

These studies have examined both product and geographical diversification effects on performance but, excepting Kim and colleagues (1989), they have had little to say about the actual interaction of the two directions of diversification. However, they have introduced the concept that international diversification may affect the same performance measures as, or moderate the performance effects of, product diversification. Both product diversification theory and the theory of the multinational firm address issues of economies of scope in application of strategic resources and of efficient transaction governance, either across business or national boundaries. The similarities in theoretical basis and performance effects of the two directions of diversification suggest that the potential for significant interaction is high. We examine this perception in the empirical portion of this article.

MODEL AND HYPOTHESES

This study examined the relationship of product diversity and international diversity to firm performance levels. We expected to find that limited levels of diversity, whether product or international, would be related to higher levels of performance.² We expected, too, that the performance effects

² Up to this point, the common term "diversification" has been used to describe scope of products or markets. However, Grant and colleagues (1988) make a distinction between diversity as a static concept and diversification as a process. As our empirical study was cross-sectional, we will use "diversity" as our term for our independent variables.

of product diversity would interact with or be moderated by the level of international diversity (Datta et al., 1991: 553).

Product Diversity

Resource-based (Conner, 1991), core competency (Prahalad & Hamel, 1990), and dynamic capability (Teece, Pisano, & Shuen, 1990) theories all attribute superior performance to competitive advantage based on idiosyncratic factors internal to firms. These "strategic" resources (Chi, 1994) are combined to generate superior outputs and can be applied across a variety of related output categories. Such unique resources are in limited supply and thus can generate consistent sustained "quasi-rents" (Peteraf, 1993). Leveraging strategic resources across product lines should provide economies of scope in addition to appropriating rents from more customers. So long as diversification stays within the scope of these resources and capabilities, it will provide increasing rents. Unrelated diversification that goes beyond this scope will not generate additional rents.

At the same time, Jones and Hill (1988) hypothesized, from a transaction cost basis, that diversification beyond a certain degree raises internal governance costs to the point that performance suffers, even in multidivisional firms. Related diversification depends on reciprocal dependency relationships within a firm. As the number of internal transactions increases exponentially with diversity, costs rise rapidly. Further, unrelated diversification, which relies on pooled interdependencies that increase linearly, can permit more divisions but will also eventually raise governance costs beyond any transactional benefit, thereby reducing efficiency.

Combining the transaction cost perspective with the resource-based viewpoint suggests that performance will vary with product diversity in a nonlinear relationship, increasing as strategic resources are given greater scope but falling off as product scope exceeds the range of these resources and governance scope surpasses management capabilities. The higher rents of related diversification are offset by more rapidly increasing governance costs, and the less costly unrelated diversification generates fewer rents. The findings of Grant and colleagues (1988) on degree of diversity and of Geringer and colleagues (1989) on relatedness of diversification type support this expectation. The performance of related diversification should surpass that of unrelated diversification. Lubatkin and Chatterjee (1994) found a curvilinear relationship between stock market return risk and a typology measure of product diversification. Christensen and Montgomery (1981) and Hoskisson and colleagues (1993) found high levels of congruence between diversification type and degree of diversity. Therefore, in terms of degree of diversity, we state the concept formally as

Hypothesis 1a: Performance should vary positively with degree of product diversity.

Hypothesis 1b: Performance should vary negatively with the square of degree of product diversity.

International Diversity

Dunning's "eclectic model" (1988, 1993) applies a logic similar to resource-based models to the multinational firm. A firm with profit-making internal capabilities (ownership factors) will seek additional profits in international market locations. If these capabilities are embedded in the firm's structure, these international markets will be internalized by foreign direct investment, ensuring the best application of these capabilities while protecting them from compromise (Buckley, 1988). So long as the ownership factors can be applied profitably, the firm will expand its international scope. Vachani (1991) suggested that this expansion may be limited by relatedness considerations across geographical markets, much like product scope expansion. However, proponents of internationalization models (e.g., Johanson & Vahlne, 1977) have proposed that experience in international markets permits firms to gradually increase their commitment to geographical expansion. The ability to manage extensive networks of international subsidiaries at low transactional costs seems to be a key capability of successful multinational firms. International diversification may have governance cost limits to its scope for a given firm at a given time, but these limits expand with experience as management capabilities increase. Relatedness and nonlinearity of the relationship between geographical diversity and performance may be specific only to certain contexts.

Kim, Hwang, and Burgers (1993) argued that the more multinational a firm is, the greater its opportunities to leverage strategic resources while simultaneously diversifying market risks, thus raising its performance. Multinationality—or the size of internalized international operations relative to overall operations—indicates the strategic importance of foreign operations and also implies the existence of strategic resources through the need for internal governance. Existence of internal foreign operations is a common reference point for defining multinational enterprises. One measure of multinationality, used by Geringer and colleagues (1989) and Grant and colleagues (1988), is the ratio of sales from foreign operations to the total sales of a firm. Other studies have used foreign asset ratio (Ramaswamy, 1993) or foreign employee ratio (Kim et al., 1989). None of these measures address the breadth or scope of foreign operations, focusing instead on the overall strategic importance of foreign operations to a firm. Although Geringer and colleagues (1989) suggested a nonlinear relationship of multinationality and performance,³ other studies have not supported it (Grant et al., 1988). Our logic as stated above suggests

Hypothesis 2: Performance should vary positively and linearly with the degree of multinationality.

³ Geringer and colleagues (1989) reported that when sales from foreign subsidiaries rise into the 80–100 percent quintile, the relation to performance turns negative. They provided no theoretical cause and found these results only for data standardized by continent of origin. We do not hypothesize such a relationship.

A second approach to international diversity is to select a measure of the breadth or scope of international operations as a determinant of performance. Shaked (1986) defined multinational corporations as those having 20 percent of sales abroad and also direct investment in at least six countries. Porter (1986) depicted two key dimensions of international strategy, coordination and configuration of operations across countries, which varies from concentrated to dispersed. Compared to multinationality ratios, which indicate the scale but not the breadth of international diversity, measures of configuration or of the *geographical scope of international operations* address the ability to arbitrage operations across countries and leverage location-based advantages (Kogut, 1985). By supplying such advantages, geographical scope should improve performance. Ramaswamy (1993) measured configuration as number of overseas plants and found a strong positive relationship to performance, also noting that a count of the number of countries in which plants are located gives similar results. Losses due to overexpansion should be mitigated by the typical gradualism of internationalization and by highly developed skills at managing international subsidiaries in a sample of multinational firms. We suggest a linear relationship, given as

Hypothesis 3: Performance level should vary positively with the geographical scope of international operations.

If international scale economies and geographical scope economies indeed address different aspects of internationality and are not identical in their performance effects, the interaction of the two effects should affect performance independent of the individual effects. For global firms, the economies of large scale plus the ability to leverage the concomitant market power across multiple boundaries and to seek less competitive markets for monopoly rents suggest a positive interactive effect. At the same time, a multidomestic strategy might imply that many markets simply dissect large amounts of overall international activity into many small, independent, and nonreinforcing parts that destroy any potential scale economies. Empirically, Ramaswamy (1993) showed that international configuration, or scope of operations, acts to moderate the scale effects of multinationality. The positive effect of configuration causes the effect of multinationality to change sign while retaining a low level of significance. He suggested that this may explain the instability of results in studies of multinationality. The combination of theory and empirical results suggests that the two aspects of international diversity have a positive interaction.

Hypothesis 4: Performance should vary positively with the interaction of multinationality and country scope.

Interaction Effects of International Diversity and Product Diversity

If related or moderate degrees of product diversity are expected to promote better performance than single-business or unrelated-diversified strategies, and international diversity is also expected to improve performance, just how can these diversity variables be expected to act together? Transaction

cost theory suggests that high levels of diversity will, in general, raise the cost of governing firms (Williamson, 1985). Thus, excessively high degrees of product and international diversity together should depress performance, as costs outstrip returns to strategic resources that are applied on an excessively broad scope (Jones & Hill, 1988). A firm that tries to apply a broad product portfolio on an integrated global basis may well stretch its management resources excessively.

In empirical studies, Geringer and colleagues (1989) tested for the effects of the interaction of product and international diversification on performance but found no significant effects. Kim and colleagues (1989) showed that the impact of product diversification categories on performance was contingent on degree of multinationalism. Where Kim and colleagues (1993) showed that multinationality should improve risk-adjusted performance, Franko (1989) showed that high levels of product diversification in geographically diverse multinationals leads to lower performance. We suggest that multinationality should improve the performance of low-product-diversity firms by providing risk diversification and a broader customer base over which to gain economies of scope to fixed resources. Moderate levels of both directions of diversity alone are associated with improved performance, but Kim and colleagues (1989) showed no effect of global diversification on related-diversified firm performance. However, they do show that more product-diversified firms perform better when they are more geographically diversified, contrary to Franko (1989) and to intuitive expectations, and that high geographical diversification seems to eliminate performance differences between levels of product diversity. The evidence suggests that more geographical diversity may improve the performance of undiversified firms, seems to have no effect on related-diversified firms, and reduces the curvilinear effects of unrelated diversification. These effects suggest that increasing levels of international diversity should reduce the impact of product diversity on performance by "flattening the regression curve." Therefore, we suggest

Hypothesis 5: The interaction of international and product diversity should reduce the effects of varying levels of product diversity on performance.

DATA, VARIABLES, AND EMPIRICAL TESTS

In our empirical model, independent variables measuring level of product and international diversity are predicted to explain one or more dependent variables measuring performance. The measures of international diversity are expected to interact with and moderate the effects of the product diversity measures. The explanatory relationship is further affected by control variables measuring exogenous conditions of either the industries or the organizations tested. Datta and colleagues (1991) suggested that the independent variables may appear as one of three types—continuous measures of degree of diversity, categorical measures of diversification strategies, or typologies of diversification mode. Several empirical studies of product diversity, such as Kim and colleagues (1989) and Hoskisson and colleagues (1993), have

used continuous measures (entropy measures in these studies) to develop categories through clustering procedures and then used these data-driven categories to explain performance differences. Most studies of geographical diversification use some form of continuous measure to describe the degree of internationalization of sales or multinationalization of operations, although Geringer and colleagues (1989) again created a categorical variable for degree of internationalization. We tested our model using continuous measures.

The model was tested on a sample of 192 large U.S. multinational manufacturing firms. These are all of the U.S. firms listed in the third (and latest) edition of *Directory of Multinationals* (Stafford & Purkis, 1989), a directory of the world's 450 largest industrial corporations with significant foreign direct investments, less four firms for which key data were not available. Firm-level data were collected from the financial tables of the *Directory* for 1987, the most recent year. Data for the diversity measures were available only for 1987 in many cases. In balancing sample size against use of multiyear data, we considered that previous studies had used multiple years only to calculate average values and chose to go with the largest sample, accepting more noise in the data. This sample is obviously biased, as it consists of large American industrial firms. It was chosen for comparability to Grant and colleagues' (1988) sample of large British manufacturing firms. However, we should note that American multinationals are typically less internationalized than similar firms from smaller markets. In addition, all the studied firms are multinationals, so that comparisons to strictly domestic firms are not possible.

Performance is most often measured in diversification studies by profit to sales or profit to asset ratios. In this study, we present findings based on a return on sales (ROS) measure as our dependent variable in all models.⁴ Geringer and colleagues (1989) provided an extensive argument in favor of using sales-based measures to avoid the effects of differential asset valuations resulting from new investment and depreciation.

As our independent variables, we used cross-sectional measures of diversity. Our measure of product diversity is a Herfindahl-type quantitative index, like that of Grant and colleagues (1988), based on the share of a firm's sales in each four-digit SIC industry (Berry, 1975) and defined as *product diversity* = $1 - \sum S_j^2$, where S_j is the proportion of a firm's sales reported in product group j . This measure, therefore, takes into account the number of segments in which a firm operates and the relative importance of each segment in sales.⁵

⁴ Hoskisson and colleagues (1993) and others have argued for the value of accounting measures of performance and demonstrated the correlation of various such measures. We also tested return on assets, obtaining similar but slightly weaker results.

⁵ This study also tested a subjective categorical measure of diversity to explain MNE performance. We tested the two measures for their comparability in describing diversification using an ANOVA. The means of the Herfindahl index for the four strategic categories are 0.29 (single business), 0.50 (dominant business), 0.63 (related business), and 0.72 (unrelated business), respectively. *T*-tests show that these mean values are significantly different. This result is consistent with the finding of Hoskisson and colleagues (1993). All the diversified categories

We used two measures of international diversity: multinationality and country scope. Multinationality is measured as the proportion of a firm's sales derived from operations outside the home country to total sales. Although it includes resale of intermediate goods and thus is not an absolute measure of the size of foreign operations, both Geringer and colleagues (1989) and Grant and colleagues (1988) used the measure, which seems to provide a reasonable relative indicator of international diversity. Country scope, as a proxy for the geographical scope of international operations, was measured as the number of foreign countries in which an MNE had operating subsidiaries in 1987. As most discussions of competitive advantage derived from the scope of international operations address tax, currency, economic, and political arbitrage, and as various firms structure their country operations differently, a country count seems to address scope issues better and less arbitrarily than a subsidiary count. As noted above, Ramaswamy (1993) used both foreign plant counts and foreign country counts in his study with similar results. We also tested the effects of the interaction of these two measures. In trying to precisely define its role in the diversity-performance relationship, we tested international diversity both as an independent variable (Hypotheses 2, 3, and 4) and as a moderator of the effects of product diversity (Hypothesis 5). Ideally, we would have controlled for the effects of different structural forms and strategic interactions of the subsidiaries of these multinationals. This was not feasible using the secondary data available to us. Therefore, effects of formal structure and global integration levels in combination with international diversity were not tested.

Following Grant and colleagues (1988), we also controlled for other variables that are likely to affect firm performance, including firm size, leverage, and industry growth. Firm size, a commonly used control variable often related to diversity levels, was measured by total revenues for 1987. Firm leverage is measured as the percentage of long-term debt to total capital (debt plus equity). Prior research has shown industry effects to have important impacts on cross-sectional variation of firm performance (Schmalensee, 1985). Some studies have used industry dummy variables (Grant et al., 1988). Christensen and Montgomery (1981) associated performance effects of product diversification specifically with relative industry growth rates. Hence, we included an industry variable, measured as the average annual growth of industry shipment over the 1982–87 period using data from the *Survey of Current Business*.

RESULTS

Table 1 presents the correlation matrix for the ROS dependent variable and the independent variables.

performed better than the single-business category. We concluded that the continuous measure provided more information and was less subjective, so the Rumelt-type categories were dropped from further analysis. Robins and Wiersema (1995) suggested weaknesses of both measures and proposed a new measure of diversification. We were not able to test their measure.

TABLE 1
Means, Standard Deviations, and Correlations^a

Variables	Means	s.d.	1	2	3	4	5	6
1. Return on sales	5.31	5.21						
2. Product diversity	0.53	0.18	.08					
3. Multinationality	28.05	14.19	.01	-.14				
4. Country scope	14.54	9.22	.19*	.02	.40*			
5. Firm size	7.12	12.34	-.02	-.19*	.15*	.25*		
6. Firm leverage	0.29	0.18	-.33*	.04	-.16*	-.15*	-.08	
7. Industry growth	5.34	5.39	.23*	.15*	-.07	.20*	-.08	-.20*

^aN = 192.

*p < .05

We used regression analysis to estimate the effects of product diversity and international diversity on MNE performance. Table 2 shows the main effect results of regressing MNE performance on product diversity and international diversity. We tested Hypothesis 1 by regressing performance (ROS) on product diversity and the size, leverage, and industry growth control variables. We modeled the predictions of Hypothesis 1 by introducing the following quadratic relationship between performance and product diversity: $ROS = \beta_0 + \beta_1 (diversity) + \beta_2 (diversity)^2$. Hypotheses 1a and 1b predict that coefficient β_1 is positive and that coefficient β_2 is negative. The results are robust and consistent for MNE return on sales (a similar result was obtained for return on assets). A clear quadratic relationship is revealed between MNE performance and the Herfindahl index measure of product diversity (model 1). This result suggests that product diversity and performance are positively related up to a point, after which increases in product diversity are associated with declining performance. The inflection point is just over 0.50 on the Herfindahl index. Hypothesis 1 is supported, and the value of a restrained degree of product diversity is strongly supported for a U.S. sample, concurring with Grant and colleagues' (1988) results for British firms.

Models 2–5 show the effects of multinationality and country scope on MNE performance. In Table 1, only country scope is significantly correlated with performance. Multinationality does not have a significant effect on firm performance (Hypothesis 2 is not supported). For Hypothesis 3, country scope has a weak positive effect ($p < .10$) on multinational firm performance when estimated with all the control variables.⁶ When the two international diversity main effects are estimated together (model 4), country scope has a significant positive effect on ROS. Adding the interaction term (model 5) to test Hypothesis 4 reduces all the international diversity main effect coeffi-

⁶ Country scope alone, in a simple regression equation, was highly significant. When the control variables were added, its significance fell dramatically. The regression was also run using country scope squared to test for unpredicted curvilinear effects, but the quadratic term was not significant.

TABLE 2
Product Diversity, International Diversity, and MNE Performance^a

Variables	Dependent Variable: Return on Sales						
	1	2	3	4	5	6	7
Intercept	-1.024 (2.247)	7.387** (1.209)	6.156** (0.104)	6.947** (1.214)	6.733** (1.618)	-0.242 (2.275)	-0.817 (3.474)
Firm size	0.021 (0.030)	-0.011 (0.029)	-0.027 (0.030)	-0.026 (0.303)	-0.025 (0.030)	0.007 (0.031)	0.002 (0.340)
Firm leverage	-9.544** (2.025)	-9.000** (2.082)	-8.541** (2.043)	-8.899** (2.062)	-8.905** (2.069)	-9.203** (2.021)	-9.224** (2.032)
Industry growth	0.154* (0.067)	0.162* (0.068)	0.138* (0.068)	0.123† (0.069)	0.123† (0.069)	0.130† (0.068)	0.134† (0.068)
Product diversity	27.289** (9.243)					26.886** (9.190)	33.552* (15.366)
Product diversity squared	-26.602** (9.447)					-26.345** (9.391)	-34.205* (16.431)
Multinationality		-0.009 (0.026)		-0.033 (0.028)	-0.025 (0.049)		
Country scope			0.075† (0.040)	0.096* (0.044)	0.114 (0.100)	0.072† (0.040)	0.159 (0.234)
Multinationality × country scope					-0.001 (0.003)		
Product diversity × country scope							-0.487 (0.985)
Product diversity squared × country scope							0.543 (0.984)
R ²	0.179	0.141	0.156	0.161	0.163	0.193	0.195
Adjusted R ²	0.157	0.122	0.138	0.138	0.139	0.167	0.160
F-statistic ^b	8.11	10.39	11.48	7.11	7.19	8.56	5.53

^a Standard errors are in parentheses.

^b Probabilities of all F-statistics are less than .001.

† $p < .10$, two-tailed test

* $p < .05$, two-tailed test

** $p < .01$, two-tailed test

cients to nonsignificance.⁷ The coefficient of the interaction term is also nonsignificant and negative, rather than showing the strong positive effect that Ramaswamy (1993) noted. The coefficient of the country scope variable is fairly consistent across all equations that do not include an interaction term.

To test Hypothesis 5, we first estimated the complete main effect model, which includes the main effects of both product diversity and international diversity on multinational firm performance but no interaction effects (model 6). International diversity is modeled by country scope, as multinationality previously showed no significant main effects. Again, the model shows a consistent quadratic relationship between product diversity and multinational firm performance, and country scope shows a positive effect on performance. All the coefficients are little changed from those in the single direction of diversity models.

In model 7, we include the interaction effect of product diversity and country scope, treating country scope as a moderating variable. We see no significant direct effects from the regression of performance on the interaction of country scope and product diversity but note that the coefficients of product diversity and product diversity squared both increase in magnitude while their levels of statistical significance drop slightly and that country scope becomes nonsignificant. The levels of R^2 and adjusted R^2 change very little. Hypothesis 5 is not supported.

We controlled for the effects of firm size, leverage, and industry growth in all models. Although not testing theory, the significant results imply that any tests that do not control for such inputs are likely to show spurious results. That the coefficients of determination are still relatively low indicates that even our more complex specifications still explain only a part of MNE performance. Firms in high-growth industries have shown a consistent pattern of better performance, and highly leveraged firms generally show a lower level of performance. Firm size was never significant, but leverage was always highly significant with a negative sign.

DISCUSSION

This study reveals a consistent quadratic relationship between product diversity and multinational firm performance across all models. This finding for U.S. manufacturing firms supports this part of the findings of Grant and colleagues (1988) for British manufacturing firms. MNE performance increases as the diversity index increases, but after a certain point it begins to decrease with further diversity. This result suggests that the relationship between degree of product diversity and performance is more complex than the linear relationship implied in most studies of degree of diversification. The result also supports the general findings of studies of diversification type on performance—that related diversification is superior. It also suggests that the implied linearity of rent increases with increasing degree of diversity,

⁷ Neither international diversity variable had a significant effect on ROA.

so long as it is related diversity, should be tempered with the governance cost arguments of transaction cost theory as explicated by Jones and Hill (1988).

Our results also show that degree of international diversity, as measured by country scope, has a positive but weaker effect on multinational performance. This follows the configuration findings of Ramaswamy (1993) but is not as strong. Multinationality, however, did not show a significant main effect on firm performance, contrary to the findings of Grant and colleagues (1988) and Geringer and colleagues (1989) but similar to Ramaswamy's (1993) findings of only weak multinationality effects. Of course, contrary to Ramaswamy, our test of the interaction of the international diversity variables was not significant. Grant and colleagues speculated that their strong multinationality effects might be specific to the context of the United Kingdom's poor macroeconomic situation of the time of their study, and Geringer and colleagues found significant effects only when their data were standardized for continent of origin, suggesting the significance of context to this effect. Our American sample, derived from a period of a strong domestic economy and a falling dollar, may not show advantages to overseas operations. Neither Geringer and colleagues nor Ramaswamy controlled for the effect of moderating factors such as firm size and leverage or for industry, and our significant control variables definitely appear to limit the effects of international diversity. We did regress performance on a nonlinear formulation for international diversity, but the quadratic term was never significant.

Our key concern, the moderating role of international diversity on the effects of product diversity on firm performance, is not established. Our full-sample regressions show an *increase* in the coefficients of the product diversity variables when their interaction with international diversity is added. These results suggest that the interaction with international diversity may exacerbate the performance effects of intermediate levels of product diversity (increase the up-and-down slopes of the curved regression line), in contrast to the results of Kim and colleagues (1989). Although hardly conclusive, this outcome is actually more in line with intuition than their results for high levels of diversity, although we do not infer performance improvement at low levels of product diversity, and the statistical significance of these slopes is low ($p < .05$). The lack of significant direct effects from the country scope main effect term and the interaction term may again arise from the inclusion of the control variables. Also, it is possible that the overall high multinationality of our sample hides the effects of international diversity that might appear in a broader sample.

Our equations have relatively low explanatory power, accounting for between 15 and 20 percent of the variance in the dependent variable. This is less than we would like, but is not atypical of such studies. Grant and coauthors (1988), despite using industry dummy variables, obtained similar R^2 values. Kim, Hwang, and Burgers (1989) explained less than 10 percent of the variance in any of their comparisons. Hoskisson and colleagues (1993) and Robins and Wiersema (1995) showed comparable levels of R^2 for studies of product diversification. A possible explanation for this is Rumelt's (1991)

assertion that most performance variance is explained by business-level effects, followed by industry effects, with only a small portion of variance explained by firm effects. Schmalensee (1985) did not test business-level effects but attributed most performance variance to industry effects rather than firm effects. As we are working at the firm level, we perhaps should not expect more than some 20 percent of variance to be explained. We might have increased our R^2 marginally if we had used industry dummies, rather than a single industry variable, but this was not the main concern of this research. We have shown that industry growth does have a performance effect and that among firm-level variables size does not have an effect on ROS and leverage has a significant effect. This effect of debt ratio in particular is seldom addressed in previous studies.

CONCLUSIONS

In conclusion, we have provided strong corroborating evidence that performance is related to product diversity in a nonlinear manner, supporting a combined resource-based and transaction cost interpretation of the effect of product diversity. We have also provided some evidence that accounting performance in multinational firms is positively related to scope of international operations, but not to the commonly used measure of international intensity, sales by foreign subsidiaries. The previous success of this variable seems to disappear when control variables for industry growth and especially firm leverage are added. We provide at best limited evidence that international diversity moderates the performance effect of product diversity.

The study has limitations that restrict its generalizability but make our findings more notable, as the sample was rather homogeneous. First, the sample firms are all large U.S. manufacturing multinationals, excluding the study's generalizability to small firms, U.S. domestic firms, or firms from other countries. Grant and colleagues (1988) performed similar tests on a U.K. sample, with similar results. Considering also the results of Geringer and colleagues (1989), the impact of international diversity on performance seems to be home-country or region dependent. A broader sample, in terms of size, international focus, or nationality, would be most interesting. For instance, these findings would probably not apply to Japanese firms, which generally have lower product diversification. Another important limitation is that this study was cross-sectional, suggesting that a timewise analysis would be a logical next step. Detailed analysis of structural type is beyond the scope of our study and is a distinct limitation of large-sample studies of secondary data. Bartlett and Ghoshal's (1989) case studies suggest that *how* diversity is managed is at least as important as the degree of a multinational firm's diversity. Finally, if Rumelt (1991) is correct about the relative importance of business and firm effects on performance, a study of international diversity at the business level would be most interesting and likely to explain a much higher percentage of performance variance.

Despite these limitations, we believe that we have taken a useful step in the analysis of diversity effects on performance. Both transaction cost and

resource-based theory suggest that excess product diversification may harm performance. We have shown that this is indeed the case for multinational firms. International diversity, as measured by scope of international operations, has a less significant linear effect on performance. This finding suggests that internationalization models may be correct about the ability of multinational firms to develop the internal capacity to manage widespread national subsidiaries through a gradualist approach. We should note, though, that American multinationals are generally less international than firms from smaller home markets, and a nonlinear effect may still appear at higher levels. Finally, all these statistical effects of international diversity are moderated by, and perhaps dominated by, the strategies and internal structures of individual firms or businesses. Our significant firm and industry control variables appear to limit the significance assigned to international diversity variables in previous studies. The incomplete models typical of such studies (as evidenced by their generally low R^2 values) may account for the instability of results noted in the introduction.

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CEO CHARACTERISTICS: DOES INDUSTRY MATTER?

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This study examined the relationships between a comprehensive set of industry conditions and CEO characteristics utilizing data from a broad range of U.S. manufacturing industries. Pooled cross-sectional time series analyses indicated that industry conditions played a limited role in explaining variations in CEO firm tenure, educational level, functional background, and functional heterogeneity. Results of subgroup regression analyses indicated that although high performers appeared to align the studied CEO characteristics more closely to industry conditions than low performers, differences between the industry coefficients in the two groups are generally small.

CEO characteristics and differences among them have emerged as topics of considerable interest in both the academic and popular business literature on executive leadership. The focus on CEOs in research on executive leadership stems from the assumption that CEOs, given their formal and symbolic power, have significant impact on both organizational activities and performance (Finkelstein, 1988; Gupta, 1988). Such research has typically focused on observable background characteristics, resting on the argument that they represent key proxies for a CEO's cognitive orientation and knowledge base with important implications for strategic decision making (Hambrick & Mason, 1984). Although past research has extensively examined the relationships between organizational factors and CEO characteristics (e.g., Dalton & Kesner, 1983; Datta & Guthrie, 1994; Schwartz & Menon, 1985), little attention has been paid to the environmental and industry context within which CEOs operate. Hence, questions such as "How do industry conditions operate?" and "What are the performance implications of the fit between industry and CEO characteristics?" have remained largely unexplored. This study sought to address this gap in existing empirical research through a systematic examination of the role of industry factors in explaining variations in CEO characteristics as well as the performance implications of such variations.

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THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES

Past Empirical Research: A Brief Review

Past empirical research on top management characteristics can be broadly divided into two categories: (1) studies that examine top management characteristics as a function of organizational and environmental antecedents (e.g., Cannella & Lubatkin, 1993; Dalton & Kesner, 1983; Datta & Guthrie, 1994) and (2) studies that examine top management characteristics as antecedent variables influencing managerial actions as well as organizational outcomes (e.g., Finkelstein & Hambrick, 1990; Hambrick, Geletkanycz, & Fredrickson, 1993; Wiersema & Bantel, 1992). This study is primarily positioned in the first group, where the relationships between environmental and organizational antecedents and CEO characteristics are of concern. In addition, the study also examines whether the fit between industry conditions and CEO characteristics has implications for financial performance.

Empirical work within the first set of studies has predominantly focused on the organizational antecedents of top management characteristics. Commonly examined antecedents include firm size (Dalton & Kesner, 1983), past performance (Cannella & Lubatkin, 1993; Dalton & Kesner, 1983; Datta & Guthrie, 1994), and strategic orientation (Michel & Hambrick, 1992; Thomas, Litschert, & Ramaswamy, 1991). In general, empirical evidence indicates that firm size is positively associated with top managers' age, their organizational and industry tenures, and selection of insider CEOs. Findings also suggest that firms exhibiting inferior performance are more likely to select outsider CEOs (Dalton & Kesner, 1983; Datta & Guthrie, 1994). In addition, organizational risk has been shown to increase the likelihood of selecting CEOs who are young, have low organizational tenure, and are outsiders (Datta & Guthrie, 1994).

Compared to the extensive research on the relationships between organizational factors and top management characteristics, empirical research linking environmental conditions to top management characteristics has been infrequent. Exceptions include a study by Pfeffer and Leblebici (1973) examining the relationships between industry concentration, growth rate, and technological change and newly selected CEOs' age through zero-order correlations. However, the use of a single time period (1972) and the bivariate examination of hypothesized relationships limits the generalizability of this study's findings. Guthrie, Grimm, and Smith (1991) explored the effects of deregulation on top management characteristics in the railroad industry, and Guthrie and Olian (1991) examined the impact of industry stability on general managers' organizational tenure and age at the time of their selection. Again, since the first study used a single-industry sample and the second focused on just one environmental antecedent (stability), their generalizability is rather limited. In summary, empirical studies grounded in a contingency perspective offer only limited understanding of how industry contingencies affect CEO characteristics. Moreover, none of these studies has examined the performance implications of fit between industry and CEO characteristics.

In addressing these limitations, the current study examined a more comprehensive set of relationships between CEO characteristics and industry conditions in a wide range of manufacturing industries covering three different time periods. It also addressed the performance implications of these relationships.

Theoretical Background

Industry conditions have been widely acknowledged as key influences on managerial actions and the competitive strategies of firms (e.g., Bain & Qualls, 1987; Porter, 1980). The literatures in industrial organization economics (Bain & Qualls, 1987; Scherer, 1980), competitive strategy (Porter, 1980), and organizational theory (Pfeffer & Salancik, 1978; Thompson, 1967) suggest that examination of industry-level influences on managerial characteristics can be meaningful in the context of such key dimensions of industry structure as degree of concentration, capital intensity, product differentiability, growth rates, and demand instability.

The degree of industry concentration, which is an indicator of the level of competition in an industry, has been extensively used as a key contingency variable in prior empirical studies (e.g., Hambrick & Lei, 1985). High levels of competitive interdependence are implied by high concentration, which in turn serves to limit the range of competitive actions (Bain & Qualls, 1987). Similarly, capital intensity, an indicator of barriers to industry entry, has been identified as having an important impact on both industry profitability and firm behavior (Bain, 1956). A firm in a capital-intensive industry is generally committed to a course of action as capital intensity often creates rigidity; new products or markets cannot be accommodated as deviations might prove expensive (Hambrick & Lei, 1985). Product differentiability (generally measured as industry advertising intensity) also forms an important basis for competition in an industry. Typically, an undifferentiated product requires firms to attend primarily to cost and efficiency considerations (Porter, 1980). Industries characterized by high differentiation offer more avenues for competition and, therefore, exhibit a wider range of competitive actions. Similarly, industries experiencing rapid growth provide greater market opportunity and competitive variation and consequently, greater managerial discretion. Finally, demand instability has been postulated to have an important effect on the nature of competition—Hambrick and Finkelstein (1987) suggested that demand volatility results in an expanded set of options for key executives, reducing inertial tendencies.

From a normative perspective, the industry factors identified above influence (1) types of competitive behavior and (2) the range of competitive behaviors considered appropriate in an industry. According to the contingency view, different industries pose different types of uncertainties (Thompson, 1967), and the choice of the type of competitive actions depends largely on the nature of the contingency. For example, given that efficiency is typically emphasized as a key success factor in capital-intensive industries, competitive actions that reflect a focus on efficiency are likely to be associated

with better firm performance in such industries (Hambrick & Lei, 1985). In a similar vein, industries that pose multiple contingencies are more likely to require a wider range of competitive actions aimed at addressing such contingencies than those posing limited contingencies. For example, rapidly growing and unstable industries, which pose more sources of uncertainty than stable industries (Hambrick & Finkelstein, 1987), often require a wider range of competitive actions to address uncertainties.

Differences in the types and range of competitive behaviors required in different industries have direct implications for the desired cognitive orientations and knowledge bases of key decision makers. As indicated by March and Simon (1958), each decision maker brings a cognitive orientation and knowledge base that significantly affect the individual's perception of a situation and the specific choices made in the situation. Cognitive orientations include information-processing ability (Finkelstein & Hambrick, 1990), cognitive rigidity (Wiersema & Bantel, 1992), and commitment to the status quo (Hambrick et al., 1993), and knowledge base includes the types and range of skills and knowledge possessed by a decision maker, such as firm-specific knowledge and function-specific knowledge (Gupta, 1984; Hambrick & Mason, 1984). Cognitive orientations and knowledge base in turn shape decision makers' assumptions about future events and knowledge of alternatives and their consequences, influencing both the types and range of competitive behaviors pursued by the decision makers. Again, from a normative perspective, to the extent that decision makers' choices are consistent with the requirements posed by their industry contexts, firm performance should be superior (Hambrick & Mason, 1984).

Following Hambrick and Mason's (1984) recommendation, research on CEO and top management characteristics has primarily used observable managerial characteristics such as tenure, education, and functional background¹ as proxies for underlying cognitive orientations and knowledge base. This practice has been necessary for several reasons. First, cognitive orientations are often difficult to measure, with some not even being amenable to direct measurement (Hambrick & Mason, 1984). Second, some characteristics of significant interest, such as functional background, do not have close psychological analogues. Finally, observable background data offer more direct practical implications in terms of executive selection and competitor analysis since such data can be obtained relatively unobtrusively from secondary data sources (Finkelstein, 1988).

Hypotheses

As noted above, the links between demographic traits and underlying cognitive orientations and knowledge bases are rather indirect. In this sec-

¹ A wide array of demographic characteristics have been examined, but firm tenure, functional background, and educational levels have received the most attention in past empirical work (Finkelstein & Hambrick, forthcoming)

tion, we discuss these relationships more deeply as a basis for the research hypotheses.

Firm tenure. Several scholars have argued that firm tenure affects both an executive's cognitive orientations and knowledge base. In terms of cognitive orientations, past research has associated longer firm tenures with restricted information processing (Miller, 1991), increased cognitive rigidity (Bantel & Jackson, 1989), and commitment to established organizational policies and practices (Hambrick et al., 1993). In terms of knowledge base, past researchers have argued that executives who have spent long periods of time within one organization are likely to have developed a high degree of organization-specific knowledge (Gupta, 1984). Such knowledge may be valuable when past practices are also appropriate for the future. Hence, relatively stable industries and contexts in which there is continuity in the types of managerial actions pursued are more likely to value long firm tenure (Finkelstein & Hambrick, 1990). However, long tenure also restricts the breadth of an executive's knowledge base. Thus, executives with such tenures may possess relatively limited perspectives and, hence, a restricted knowledge base from which to conduct a "limited search" of alternatives (Pfeffer, 1983).

Empirical studies offer evidence indicating that these differences in cognitive orientation and knowledge do affect the types and range of strategies pursued by executives with varying levels of firm tenure. Studies by Chaganti and Sambharya (1987) and Thomas and colleagues (1991) indicate that longer firm tenures are associated with stability and efficiency-oriented strategies, whereas shorter firm tenures are associated with product-market innovation and differentiation strategies. Finkelstein and Hambrick (1990) and Hambrick and colleagues (1993) also found significantly positive relationships between executives' firm tenures and firms' tendencies to persist with their past strategies.

The theoretical arguments and empirical evidence discussed above suggest that the appropriateness of long firm tenures depends on industry context. On the one hand, high levels of industry concentration are associated with greater competitive stability and continued emphasis on strategies that acknowledge mutual interdependence. Similarly, high levels of capital intensity tend to limit the range of alternatives considered to primarily efficiency-based ones. Thus, both these industry characteristics indicate that long firm tenures will be valued. On the other hand, firms in industries characterized by high levels of differentiation, rapid growth, and instability are less likely to value organization-specific experience. Such contexts require a broader knowledge base and the ability to explore and evaluate a range of competitive behaviors going beyond those adopted in the past (Hambrick & Finkelstein, 1987). These arguments lead to the study's first research hypothesis.

Hypothesis 1: CEO firm tenure will be positively associated with industry concentration and capital intensity and negatively associated with product differentiation, industry growth, and demand instability.

Educational level. Educational level has been viewed in the management literature as an indicator of an individual's various cognitive orientations. Specifically, researchers have equated a high attained level with greater capacity for information processing and receptivity to innovation (e.g., Guthrie et al., 1991; Wiersema & Bantel, 1992). Consistent with the argument that educational level reflects an individual's openness to change and propensity to identify and evaluate newer alternatives, empirical research has found positive relationships between the educational levels of senior executives and the amount of innovation and strategic change in their organizations (e.g., Kimberly & Evanisko, 1981; Thomas et al., 1991; Wiersema & Bantel, 1992).

Dynamic industries pose multiple challenges for top managers—the managerial work is more varied (Mintzberg, 1973) and the information-processing task is generally more complex (Daft, Sormunen, & Farks, 1988). Effective managers in such environments must be able to discriminate among a variety of alternative (and often contradictory) stimuli and therefore should ideally possess great capacity for information processing. In other words, such contexts require CEOs to be creative and open minded (Hambrick et al., 1993). Similarly, in industries characterized by high levels of differentiation, executives need to explore and assess a wide variety of competitive actions and to be receptive to relatively new types of strategies. In support of this argument, Thomas and colleagues (1991) found that CEOs with high educational levels tended to pursue strategies that emphasized differentiation and innovation. Overall, these arguments suggest that high levels of education are likely to be more valued in industries characterized by high growth rates, demand instability, and product differentiation.

Hypothesis 2: CEO educational levels will be positively associated with product differentiation, industry growth, and demand instability.

In the absence of compelling theoretical arguments, no relationships are postulated for concentration levels and capital intensity.

Functional background. Functional background is regarded as an important indicator of the types of knowledge and cognitive biases that top managers bring to their jobs. Functional backgrounds have been shown to directly influence how problems are defined (Dearborn & Simon, 1958), information is processed (Walsh, 1988), and strategic choices are made (Hitt & Ireland, 1985). Although top managers, especially CEOs, are presumed to have a generalist's view, they are often functionally specialized (Gupta, 1984), bringing to their jobs knowledge and skills that are partly shaped by their functional experience. These functional orientations are in turn likely to influence the types of strategies they pursue.

Hambrick and Mason (1984) labeled functional backgrounds in production, process R&D, and accounting as "throughput" backgrounds and those in marketing and sales, merchandising, product R&D, and entrepreneurship as "output" backgrounds. The types of functional backgrounds likely to be valued in different industries depends upon the critical contingencies their

environments pose (Pfeffer & Salancik, 1978). For example, in highly capital-intensive industries, efficient management of assets is critical, given the high investment in fixed capital assets and the high fixed costs in these environments (Hambrick & Schecter, 1983). Similarly, in low-growth industries, cost cutting and other efficiency measures become very critical to maintaining profit levels (Harrigan, 1981). In other words, throughput backgrounds are more likely to be valued in industries characterized by high levels of capital intensity or concentration and lower growth. In differentiable industries and industries with high growth rates, however, conditions encourage the search for new and multiple ways to compete and the continued development of new markets and products. The need to foster creativity and a greater willingness to depart from previous practices means that output backgrounds with strong marketing or product R&D skills are likely to be more valued (Haleblian & Finkelstein, 1993). These arguments have been supported in empirical studies that have found positive relationships between CEOs' (1) output functional backgrounds and product-market innovation strategies and (2) throughput functional backgrounds and efficiency-oriented strategies in industries as diverse as tobacco (Chaganti & Sambharya, 1987) and computers (Thomas et al., 1991).

The above arguments are reflected in the following research hypothesis:²

Hypothesis 3: The degree of throughput functional orientation in a CEO's functional background will be positively associated with industry concentration and capital intensity and negatively associated with product differentiation, industry growth, and demand instability.

Functional heterogeneity. Although functional background reflects a CEO's predominant functional orientation, the variety of functions to which the CEO has been exposed during the length of his or her career reflects the breadth (or narrowness) of the individual's functional perspective (Gupta, 1984). CEOs who are highly specialized in one particular functional area are likely to be more socialized and inculcated with the mode of thinking and acting that is typical for that functional area. They are likely to perceive and interpret problems and seek solutions that are consistent with their prior limited functional experiences (March & Simon, 1958). On the other hand, CEOs with diverse functional experiences are more likely to explore alternatives and their consequences from a wider variety of functional perspectives (Dearborn & Simon, 1958). Thus, the extent of heterogeneity in executives' functional backgrounds should affect both the types of functional knowledge they bring to their tasks and the ways in which they define problems and make choices.

The above arguments indicate that the value of specialized and diversified functional experience is also likely to vary with industry conditions.

² The direction of the hypothesized relationships would be just the opposite if we used output functional background as the dependent variable.

For example, specialization in a given functional area is more likely to be valued in an industry in which that area is critical for success; for example, senior executives with R&D backgrounds are common in the pharmaceutical industry. Greater functional specialization is also likely to be valued in stable environments, where cause-effect relationships are easily understood and competitive variations are limited (Haleblian & Finkelstein, 1993). Such conditions are more likely at high levels of concentration and capital intensity, in low-growth industries, and in less differentiated industries. In industries offering multiple ways to compete and emphasizing multiple critical success factors, executives with heterogeneous functional backgrounds are more likely to be valued, given their broader knowledge of alternatives from a variety of functional perspectives and superior ability to evaluate consequences from the standpoint of different functional areas. Thus,

Hypothesis 4: CEO functional heterogeneity will be positively associated with product differentiation, industry growth, and demand instability and negatively associated with levels of concentration and capital intensity.

Performance implications of the fit between industry and CEO characteristics. The four research hypotheses discussed above are rooted in a normative view of the relationships between industry and CEO characteristics. Firms are likely to match CEO characteristics to the requirements posed by an industry context because: (1) such characteristics influence the type and range of competitive actions executives pursue and (2) the appropriateness of the type and range of competitive actions depends upon the industry context. If the normative logic underlying these hypotheses is valid, we should find a closer fit between industry conditions and CEO characteristics among the better performers in an industry than among the poorer performers (Hambrick & Mason, 1984). Thus,

Hypothesis 5: The relationships between CEO characteristics and industry conditions postulated in Hypotheses 1 through 4 will be stronger for firms performing well than for those performing poorly.

METHODS

Sample and Time Frame

The sample chosen for this study had to satisfy two criteria. First, the firms had to be primarily single-business firms since the effects of industry characteristics on CEO characteristics can be more directly assessed for non-diversified firms (Gupta, 1988). Second, the firms had to be large, since relationships between industry structure and individual firms' behaviors are likely to be most pronounced for the principal firms in an industry (Williamson, 1963). To satisfy these conditions, we adopted the following procedure for sample selection: first, all firms in manufacturing industries (two-digit Standard Industrial Classification [SIC] codes 20–39) with sales

of at least \$100 million and deriving at least 70 percent of their sales revenues from a single four-digit SIC code were identified from COMPUSTAT business segment tapes for 1987. Second, to ensure that sample firms were nondiversified throughout the study period, we assessed each firm's sales composition for two earlier years, 1977 and 1982, using information contained in 10-K statements and *Ward's Directory of Largest U.S. Public Corporations*. Data availability on CEO characteristics and firm-specific controls resulted in a maximum sample of 410 firms representing 29 four-digit manufacturing industries distributed over three time periods as follows: 1983–87, 170 firms; 1978–82, 135; and 1973–77, 105.

The study used multiple cross sections for two major reasons. First, parameter estimates obtained from a single cross section are often biased by idiosyncratic effects of the period chosen. Taking multiple cross sections under differing conditions reduces the likelihood of such biases (Murray, 1989). Second, since industry and firm-specific conditions are likely to change over time, multiple cross sections provide a stronger test of the robustness of empirical findings. As a result, both internal validity and generalizability are enhanced.

Measures

Industry characteristics. *Industry concentration* was measured using the four-firm concentration ratio (Harrigan, 1981) for 1977, 1982, and 1987. *Capital intensity* was defined as a ratio of an industry's gross book value of assets to the value of annual shipments, again for 1977, 1982, and 1987. *Industry growth* was defined as average annual rate of growth in the value of shipments (adjusted for inflation) for the five years preceding 1977, 1982, and 1987 (Dess & Beard, 1984). *Demand instability* was measured as the coefficient of variation of the annual values of shipments over the same three periods (Haleblian & Finkelstein, 1993). Finally, *product differentiation* was defined as the degree of average advertising intensity in an industry over the three five-year periods (Rajagopalan & Prescott, 1990). Data on concentration ratios, annual values of shipments, and industry gross book values of assets were measured at the four-digit level and obtained from various volumes of the U.S. Census of Manufactures. Advertising intensity (at the three-digit level) was obtained from the *Troy Almanac of Key Business and Industrial Financial Ratios*.

Organizational variables. Previous work on CEO and top management team characteristics has consistently identified the crucial role of three organizational variables in explaining variations in managerial characteristics: size, growth rates, and performance (Finkelstein & Hambrick, 1990; Haleblian & Finkelstein, 1993; Wiersema & Bantel, 1992). *Firm size* was measured as the natural logarithm of the average number of employees in the three years preceding each of the focal years (1985–87; 1980–82, 1975–77), a measure extensively used in past research (e.g., Dalton & Kesner, 1983; Guthrie & Olian, 1991). *Firm sales growth* was defined as the percent change in total company sales over each focal period adjusted for inflation (Davidson,

Worrell, & Cheng, 1990). Data on these two variables were obtained from annual COMPUSTAT tapes and used as control variables for testing the five research hypotheses.

Finally, in order to examine the performance implications of fit between industry and CEO characteristics, we used a composite measure of *firm performance*. Drawing on a procedure suggested by Venkatraman and Ramamujam (1986), we standardized three financial measures of performance (return on sales, return on equity, and return on assets) within each firm's industry (four-digit SIC) and then averaged values to create a composite measure of firm performance for each year. Three-year averages for composite performance were then computed from annual COMPUSTAT tapes.

CEO characteristics. CEO *firm tenure* was defined as the number of years a CEO had served in a firm (Michel & Hambrick, 1992). CEO *educational level* was measured on a seven-point scale based on the highest degree earned by a CEO (1 = high school, 2 = some college, 3 = undergraduate degree, 4 = some graduate school, 5 = master's degree, 6 = attended doctoral program, and 7 = doctorate). Past functional experience (number of years in each function) was categorized into one of seven different categories (1 = production/operations, 2 = finance/accounting, 3 = marketing, sales, and merchandising, 4 = product R&D, 5 = process R&D, 6 = entrepreneurial, and 7 = planning and general management). Finkelstein (1988) was the source of both the education and experience measures. *Throughput functional orientation* was a continuous measure³ defined as the number of years spent in functional categories 1, 2, or 5 expressed as a percentage of the total number of years spent in categories 1 through 6; thus, a CEO with a rating of 70 percent on throughput functional background would automatically be assigned a score of 30 percent on the output measure. Finally, CEO *functional heterogeneity* was defined as $1 - \sum_i p_i^2$, where p_i was the proportion of a total career spent in each of the seven functional areas identified above (Blau & Schwartz, 1984). The higher the score on this index, the lower a CEO's functional specialization. All four CEO characteristics were computed from data obtained from *Dun & Bradstreet's Reference Book of Corporate Management* and *Who's Who in Finance and Industry*.

Data Analysis

As previously discussed, CEO data were collected for three years, 1977, 1982, 1987, and all other measures (except concentration and capital intensity) were three or five-year averages corresponding to the periods preceding the three focal years. When the data were pooled across firms and across these three years, the resulting sample had 410 usable observations. Although

³ We are grateful to an anonymous reviewer for suggesting this approach. When we used a categorical measure to represent CEO throughput functional background (e.g., Bantel & Jackson, 1989; Smith & White, 1987), we obtained results very similar to those reported in this paper utilizing the continuous measure.

pooling yields more precise estimates because of the larger sample it makes possible, there are potential pitfalls. First, observations may no longer be independent because of enduring organizational and CEO characteristics that are correlated over time (Finkelstein & Hambrick, 1990; Halebian & Finkelstein, 1993). However, ordinary-least-squares (OLS) estimates in our analysis consistently yielded a Durbin-Watson statistic greater than 1.75 with first-order correlation less than .20, indicating that autocorrelation was not a problem. Second, since the data consisted of multiple cross sections, heteroskedasticity might have been a factor. When we plotted the residuals against firm size, the scale variable (Rajagopalan & Prescott, 1990), the analysis indicated absence of heteroskedasticity in the data; hence, no corrections were made. Third, pooling might result in the violation of the assumption of homogeneity in sample characteristics across different time periods, resulting in biased OLS pooled estimates. To assess this possibility, we conducted paired Z-tests for each combination of time periods for each of the five industry characteristics as well as the three firm-specific variables. Of the resulting 24 tests, only one was significant ($p < .05$, for difference in industry growth rates between 1977 and 1987). Hence, we considered the assumption of sample homogeneity across different time periods appropriate.

To test Hypotheses 1–4, we estimated OLS regression equations for the pooled sample for each of the four CEO characteristics after controlling for firm size and firm sales growth rates. To test Hypothesis 5, we divided the pooled sample into two subgroups based on a median split on the composite firm performance measure and estimated the same OLS regression model for each subgroup. Differences between beta coefficients in the two subgroups were then assessed through *t*-tests (Arnold, 1982).

RESULTS

Table 1 presents the means, standard deviations, and correlations among all variables for the pooled sample. Table 2 presents the results of the OLS multiple regression analyses for firm tenure, educational level, functional background, and functional heterogeneity for the pooled sample.

The OLS regression results for CEO tenure in the firm (Hypothesis 1) indicate that, as expected, advertising intensity was negatively associated with CEO firm tenure ($p < .05$). However, contrary to prediction, concentration was negatively associated with firm tenure ($p < .01$). No significant relationships (at $p < .05$) were observed for the other variables (capital intensity, growth rate, and demand instability). Also, of the three relationships specified in Hypothesis 2, only one was supported—there was a positive relationship between CEO educational level and industry advertising intensity ($p < .01$). The coefficients associated with industry growth rate and demand instability, although in the hypothesized direction, were not significant.

Three out of five hypothesized relationships in the context of functional background (Hypothesis 3) were supported. CEO throughput functional orientation was positively associated with capital intensity ($p < .05$) and nega-

TABLE 1
Means, Standard Deviations, and Correlations^a

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1. Firm tenure	21.47	11.92											
2. Educational level	3.84	1.43	-.19										
3. Throughput orientation	57.23	43.74	-.01	-.30									
4. Functional heterogeneity	0.36	0.22	.00	.06	-.10								
5. Concentration	37.45	13.99	-.09	.04	.09	.16							
6. Capital intensity	44.48	28.90	.09	.07	.09	-.15	-.02						
7. Advertising intensity	1.51	1.69	-.13	.08	-.25	.13	-.25	-.22					
8. Growth rate	3.83	7.02	-.09	.06	-.20	.03	-.01	-.21	.03				
9. Demand instability	11.79	8.01	.09	-.05	-.14	.10	.05	.04	-.39	.06			
10. Firm size	1.58	1.56	.21	.05	.05	.27	.12	-.00	-.17	-.01	.19		
11. Firm sales growth	9.23	23.81	-.28	.10	-.05	.07	.09	-.08	.07	.23	-.18	-.19	
12. Firm performance	-0.01	0.91	.05	.08	.07	.06	.05	-.01	.01	.07	-.08	.09	.13

^a Because data are pooled, correlations tend to be overstated. Correlations greater than .18 are significant at $p < .001$, those between .121 and .18 at $p < .01$, and those between .095 and .12 at $p < .05$.

TABLE 2
Results of OLS Regression—Pooled Sample^a

Variables	Firm Tenure	Educational Level	Throughput Orientation	Functional Heterogeneity
Concentration	-0.106** (0.042)	0.003 (0.005)	0.111 (0.181)	0.002** (0.001)
Capital intensity	0.013 (0.020)	0.008** (0.002)	0.175* (0.088)	-0.001*** (0.000)
Advertising intensity	-0.797* (0.378)	0.151** (0.047)	-5.004** (1.954)	0.001 (0.007)
Growth rate	-0.184† (0.110)	0.015 (0.010)	-1.141** (0.360)	0.002* (0.001)
Demand instability	-0.034 (0.077)	0.004 (0.009)	-0.375 (0.339)	0.000 (0.001)
Firm size	1.301*** (0.369)	0.075† (0.045)	0.259 (1.700)	0.035*** (0.006)
Firm sales growth	-0.111*** (0.025)	0.007* (0.003)	0.075 (0.125)	0.000 (0.000)
Intercept	26.027*** (2.557)	2.785*** (0.313)	58.181*** (12.258)	0.159*** (0.046)
F	8.410***	3.690***	4.548***	8.488***
R ²	0.128	0.067	0.105	0.129
N	410	368	312	410

^a Standard errors are in parentheses.

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

tively associated with industry advertising intensity and industry growth rate ($p < .01$). However, no significant relationships were found for demand instability or concentration. Finally, in the case of CEO functional heterogeneity (Hypothesis 4), as hypothesized, capital intensity was negatively associated ($p < .001$) and industry growth rate positively associated ($p < .05$) with such heterogeneity. However, contrary to hypothesis industry concentration was positively associated with functional heterogeneity ($p < .01$), and no significant results were observed for demand instability and advertising intensity.

Table 3 presents results of the subgroup regressions (high versus low performers) estimated to test Hypothesis 5.

As is evident from Table 3, eight of the nine significant⁴ relationships ($p < .05$) found in the pooled sample (Table 2) were also supported in the subgroup of high performers. In contrast, only three of the nine relationships were significant among the low performers. However, out of the nine *t*-tests conducted to assess if the differences in beta coefficients were statistically significant across these two subgroups, only one (the difference between the advertising intensity coefficients in the throughput functional background equations) was significant ($p < .05$). This finding indicates that although the fit between industry conditions and CEO characteristics is tighter in the case of high performers, the performance implications of achieving such a fit are not very significant.

DISCUSSION AND CONCLUSIONS

This study was motivated by the need to address a key gap in the literature on CEO characteristics. As discussed earlier, extant empirical research has focused almost exclusively on the relationships between organizational factors and CEO characteristics, leaving the link between environmental and CEO characteristics both theoretically and empirically underdeveloped. In order to address this gap, this study examined the relationships between four key CEO characteristics and five different industry characteristics in a sample of nondiversified U.S. manufacturing firms over three time periods. The study also examined if observed relationships varied across firms with high and low performance.

Overall, the results of this study indicate that industry factors play a limited role in explaining variations in CEO characteristics and the performance implications of such variations. Of the 18 relationships postulated in Hypotheses 1 through 4, only 7 were significant in the hypothesized direction (at $p < .05$). Two other relationships were significant in the pooled sample, but their direction was opposite to that hypothesized (the effects of concentration on firm tenure and functional heterogeneity). These results, combined with the strong effects observed for the control variables, firm size and sales

⁴ The significant relationship between capital intensity and educational level is not included since it was not *a priori* hypothesized.

TABLE 3
Results of OLS Regression—High Performers Versus Low Performers^a

Variables	Firm Tenure		Educational Level		Throughput Orientation		Functional Heterogeneity	
	High Performers	Low Performers	High Performers	Low Performers	High Performers	Low Performers	High Performers	Low Performers
Concentration	-0.060 (0.060)	-0.145* (0.060)	-0.005 (0.007)	0.008 (0.007)	-0.025 (0.253)	0.226 (0.270)	0.002* (0.001)	0.002* (0.001)
Capital intensity	0.035 (0.029)	-0.028 (0.028)	0.009** (0.003)	0.007* (0.003)	0.258* (0.123)	0.123 (0.128)	-0.002* (0.001)	-0.002* (0.001)
Advertising intensity	-1.235* (0.535)	-0.234 (0.526)	0.152* (0.063)	0.129† (0.071)	-9.911*** (2.876)	-2.286 (2.734)	0.009 (0.010)	-0.006 (0.009)
Growth rate	-0.169 (0.117)	-0.089 (0.117)	0.021 (0.014)	0.013 (0.014)	-1.717*** (0.505)	-0.574 (0.523)	0.004* (0.002)	0.002 (0.002)
Demand instability	-0.098 (0.108)	0.063 (0.108)	0.000 (0.013)	0.002 (0.013)	-0.211 (0.488)	-0.523 (0.479)	0.001 (0.002)	0.000 (0.002)
Firm size	1.974*** (0.493)	0.575 (0.561)	0.038 (0.059)	0.104 (0.072)	0.075 (2.274)	1.032 (2.885)	0.034*** (0.009)	0.036*** (0.010)
Firm sales growth	-0.156*** (0.035)	-0.067† (0.036)	0.008* (0.004)	0.004 (0.004)	0.160 (0.191)	-0.072 (0.173)	0.000 (0.001)	0.001 (0.001)
Intercept	21.641*** (3.779)	29.248*** (3.479)	3.216*** (0.459)	2.531*** (0.436)	79.992*** (17.647)	34.423* (17.314)	0.186* (0.072)	0.143* (0.062)
F	8.599***	2.694*	2.658*	1.509	4.078***	1.659	4.534***	4.127***
R ²	0.234	0.087	0.095	0.057	0.173	0.084	0.138	0.128

^a Standard errors are in parentheses.

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

growth, indicate that industry factors might be less salient than firm-specific factors in explaining variations in CEO characteristics. Further, only one of nine pairs of beta coefficients was significantly different between the high- and low-performing subgroups, which appears to indicate that matching CEOs to firm-specific contingencies might be more relevant from the viewpoint of performance than is matching CEOs to industry conditions. Both these observations are consistent with a strategic choice perspective (Child, 1972), according to which firm-level variables are more salient than environmental variables in explaining variations in firms' strategic choices as well as in their performance.

The results pertaining to the relationships between industry concentration and CEO characteristics in the pooled sample were quite unexpected—where concentration was significant, the direction was opposite to that hypothesized. To further examine the relationship between concentration levels and CEO characteristics, we added a squared term for concentration to the OLS models for tenure in firm and functional heterogeneity. The squared term was positive where the main effect was negative (for firm tenure) and negative where the main effect was positive (for functional heterogeneity). This result implies a U-shaped relationship between concentration and firm tenure and an inverted U-shaped relationship between concentration and functional heterogeneity. These findings are consistent with the notion that concentration level in an industry is an important indicator of the extent of competitive uncertainty. Economists (e.g., Williamson, 1963) have argued that the greatest scope for competitive uncertainty and discretionary behavior occurs at moderate levels of concentration. It is therefore not surprising that our study found lower tenures and higher functional heterogeneity at medium levels of concentration. The nature of our sample (22 of the 29 industries had moderate concentration, with four-firm concentration levels between 25 and 60) probably explains the U-shaped relationship observed in this study.⁵

The findings presented here must also be viewed in the context of study limitations. First, although the theoretical arguments presented here imply a causal link from the industry to the CEO characteristic, the research methods adopted make it difficult to assess the direction of causality. For example, it is plausible that CEOs with certain cognitive orientations and experiences are more likely to select certain types of industries. In other words, we cannot truly answer the question, do CEOs select industries or do industry conditions drive the selection of certain types of CEOs? Second, the study relied on demographic data, which represent only proxies for underlying cognitive orientations and may not fully capture the cognitive variables of interest. Third, given our focus on the relationships between industry and

⁵ Possible nonlinear U-shaped relationships for other variables were also examined by introducing squared terms (one at a time). None turned out to be significant, so no further evidence indicated nonlinear relationships.

CEO characteristics, this study was necessarily restricted to single-business firms. However, with many firms not conforming to the definition of a single-business organization adopted in this study, the generalizability of our findings is limited to nondiversified firms. Fourth, given that the sample was restricted to relatively large firms, the results may not be generalizable to smaller firms. As Hambrick and Finkelstein (1987) argued, firm size is a key determinant of the extent of managerial discretion and hence, the relationships between CEO characteristics and industry conditions are likely to vary across firms of different sizes.

In order to address the limitations noted above, future research needs to examine variations in CEO characteristics and their associations with environmental characteristics among diversified firms as well as smaller firms. Finally, the theoretical arguments presented here can also be meaningfully extended to study CEO-environment relationships in service industries, which typically exhibit very different characteristics from manufacturing industries. Such research, which builds on the current study, should also provide a better understanding of the antecedents and consequences of the fit between top managers and their environments in different organizational contexts.

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HYBRID ORGANIZATIONAL ARRANGEMENTS AND THEIR IMPLICATIONS FOR FIRM GROWTH AND SURVIVAL: A STUDY OF NEW FRANCHISORS

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This study proposes that hybrid organizational forms provide a way to overcome the agency problems of adverse selection and moral hazard in selecting, assimilating, and monitoring new managers. Consequently, hybrid forms allow firms to overcome managerial limits to firm growth and therefore grow faster. Specifically, the study shows empirically that the degree to which a firm emphasizes franchising as its expansion strategy has a significant, positive effect on its growth and survival.

An understanding of the factors that limit the rate of firm growth is valuable for management scholars (Mahoney & Pandian, 1992). Firm growth rates are important to theories that explain firms' efficiency, market power, profitability, and survival (Slater, 1980). Given the importance of understanding growth, which has been an issue at least since Penrose's (1959) seminal contribution, organizational researchers have examined the managerial limits to firm growth.

Much of the work on firm growth has implicitly assumed that growth depends on the expansion of assets owned by a firm. For example, if a firm expands the number of outlets in its retail distribution system, the implicit assumption is that it builds or buys more outlets. Given this assumption, much of the research on growth has logically incorporated Penrose's (1959) observation that a firm's growth is constrained by the speed at which it can expand its managerial capacity. This constraint holds because a relationship exists between asset size and the amount of monitoring required by a firm.

However, recent research has suggested that firms may be able to overcome managerial limits to firm growth through the use of contractual organizational forms. Larson (1992) found that new and growing firms, in general, tend to have a disproportionate preference for hybrid organizational forms. And Teece (1986) showed that hybrid organizational forms allow resource-limited firms to gain control over co-specialized assets. These findings raise an important question for researchers interested in theories of firm growth: Do contractual organizational forms allow firms to grow faster by overcoming managerial limits to firm growth?

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Recent research on franchising suggests that the answer is yes (Norton, 1988b). This research applies the principles of agency theory to explain how the use of contractual organizational forms deters moral hazard and adverse selection at a lower monitoring cost than is incurred when company-owned retail outlets are used (Norton, 1988a). By reducing the rate at which monitoring costs increase during growth, franchising may allow firms to grow faster. Since rapid growth is necessary to the achievement of a size at which the operations of new firms are cost competitive with those of established firms, franchising may also enhance the probability that firms will survive.

The purpose of this research was to examine the impact of contractual organizational forms on the rate of firm growth by examining a sample of 138 firms that first began to franchise in the United States in 1983. The article proceeds in the following manner: The next section describes business format franchising and explains why studying this organizational form is useful to understanding firm growth. The section also develops the agency theory explanation for why franchising enhances firm growth and survival. The third section of the article describes the methodology used to test this explanation. The fourth section describes the results of this analysis. The fifth section draws conclusions and implications from the study.

THEORETICAL FRAMEWORK AND HYPOTHESES

Franchising

Business format franchising is an organizational form based on a legal agreement between a parent organization (the franchisor) and a local outlet (the franchisee) to sell a product or service using a brand name developed and owned by the franchisor. The franchisor typically sells the franchisee a right to use this intellectual property in return for a lump sum payment and an annual royalty fee based on sales for a specified period of time (Miller & Grossman, 1990). In addition, the franchisee usually agrees to adhere to franchisor requirements for product mix, operating procedures, and quality. In return, the franchisor typically agrees to provide managerial assistance, training, advertising assistance, operating procedures, and site selection (Rubin, 1978).

Business format franchising is a popular example of a hybrid organizational form that incorporates elements of both markets and hierarchies (Williamson, 1991). It is a hybrid alternative since the franchisor both retains a degree of ownership and authority over the use of the trade name, operating procedures, and the locations of outlets and contracts with independent entrepreneurs to operate the units (Child, 1987).

Business format franchising provides a useful laboratory for examining the effect of hybrid organizational forms on the rate of firm growth. Franchisors exploit the same retail markets using the same business concepts through both franchised and company-owned outlets. Consequently, by looking at franchisors, researchers can examine the effects of organizational form on the rate of the growth of firms, holding constant firm and market differences.

This approach provides a clearer picture of the effects of organizational form on firm growth rates than would be the case if independent businesses were examined.

Agency Theory Framework

In most modern corporations, managers are not the primary owners of the organizations that they manage. This separation of ownership and control has led scholars to examine the mechanisms that owners have developed to ensure that employees act in accordance with the owners' goals. One of these mechanisms has been the development of franchising, a hybrid organizational form that allocates ownership rights to the managers of retail outlets.

Agency theory provides a valuable theoretical context in which to examine the effect of hybrid organizational arrangements on firm growth since it examines the relative efficiency of hiring employees and making them owners (Alchian & Demsetz, 1972). Since entrepreneurs are compensated through residual claimancy on the profits of a firm and employees are compensated through wages, each is motivated by different goals and may, therefore, behave in different ways (Eisenhardt, 1988). As a result, under conditions of uncertainty, entrepreneurs cannot be sure that employees are acting in their interests without incurring monitoring costs to do so. This situation gives rise to two problems that entrepreneurs face: Adverse selection and moral hazard (Jensen & Meckling, 1976). Moral hazard exists when an entrepreneur cannot know for certain if an employee is working hard or is shirking. Adverse selection exists when an employee misrepresents his or her true abilities (Eisenhardt, 1988).

Agency theory proposes two solutions to these problems: Residual claimancy and monitoring. The first solution is to replace wage contracts with hybrid organizational arrangements like franchising that provide residual claimancy to employees. Residual claimancy aligns the employees' goals with those of the entrepreneur and reduces the problems of moral hazard and adverse selection (Jensen, 1983). The second solution is to increase the amount of information about the agent's behavior by monitoring the agent. The more information the principal has, the harder it becomes for the agent to shirk or misrepresent abilities (Eisenhardt, 1988). Which solution is superior depends on the cost of monitoring employees relative to the cost of establishing a franchise (Jensen & Meckling, 1976). The thesis of this article is that when firms grow rapidly, franchising, which provides residual claimancy, is a superior solution to monitoring employees.

Entrepreneurial capacity problem. As firms grow, entrepreneurs must find new markets, develop new products, and pursue new business opportunities at the same time that they must monitor their employees to minimize problems of adverse selection and moral hazard (Jensen & Meckling, 1976). However, entrepreneurs are endowed by nature with limited time (Norton, 1988a). Given this limitation, entrepreneurs must hire employees to undertake activities that they do not have time to undertake. Hiring these new employees creates a problem of adverse selection. Potential new employees

have different training and innate abilities and so differ in their capabilities. Therefore, entrepreneurs face uncertainty about the quality of potential new employees (Coyte, 1984). Entrepreneurs would like to select more qualified employees. However, this preference creates an incentive for the less qualified to misrepresent their abilities to obtain employment. This adverse selection requires entrepreneurs to incur costs to differentiate more qualified applicants from the less qualified (Levinthal, 1988).

The faster a firm grows, the greater these costs will be. Faith, Higgins, and Tollison (1984) explained that the faster firms grow, the more the entrepreneurs will need to hire employees about whom they have no previous information. The more they hire people about whom they have no information, the greater the cost of gathering information.

Adverse selection also exists when new employees are assimilated into an organization. Since new employees are heterogeneous in their skills, backgrounds, and training, the optimal division of labor requires the assignment of individuals to appropriate jobs within the organization (Slater, 1980). The entrepreneur knows what skills, background, and training are necessary for each job but does not know which new employees possess the appropriate skills, background, and training for them. Jobs differ in their desirability, and new employees prefer the jobs that pay the highest risk-adjusted compensation relative to the effort they demand. Therefore, potential new employees have an incentive to cause the entrepreneur to believe that they have the appropriate skills, training, and backgrounds for the most desirable jobs even if they do not. Given this incentive for adverse selection, the entrepreneur must incur costs in gathering information to determine which jobs are appropriate to which new employees (Prescott & Visscher, 1980).

Moreover, the cost of gathering information to overcome this adverse selection problem grows greater the faster a firm grows. When a firm grows quickly, an entrepreneur has less time to evaluate new hires. To avoid mismatches between jobs and abilities when observation time is short, the entrepreneur has to incur greater costs to determine the capabilities of the new employees (Prescott & Visscher, 1980).

Entrepreneurs also face the problem of moral hazard when they hire new employees. Since entrepreneurs cannot increase the amount of time they have available to them, firm growth means that they must hire managers to monitor employees. The hiring of nonentrepreneur monitors raises monitoring costs in two ways.

First, managers cannot completely substitute for owners because their lack of ownership incentives leads them to shirk (Alchian & Demsetz, 1972). As a result, entrepreneurs need to monitor managers. Consequently, when a firm grows from a simple structure to a professional management structure, the ratio of monitors to production workers increases, raising the cost of monitoring (Silver & Auster, 1969).

Second, the use of hired monitors increases the cost of observing the behavior of employees. The bounded rationality of human beings means there are physical limits to the spans of control people can handle (Simon,

1958). As a result, entrepreneurs need to develop hierarchies to channel information flows. The creation of hierarchies means that information traveling between an entrepreneur and a production worker is channeled through an increasing number of people. This channeling leads to an increase in opportunities for information to be lost or distorted (Williamson, 1967).

An entrepreneur needs to monitor employees to know if the information is lost through deliberate distortion or by accident. This means that, as the opportunities for moral hazard increase, the entrepreneur must expend greater resources on monitoring to deter it. By adding new monitoring and control mechanisms, the entrepreneur can keep the problem of moral hazard from increasing as the organization grows, but at the cost of increased monitoring expenditure.

Franchising as a mechanism to reduce agency problems of firm growth.

To reduce the problems of adverse selection and moral hazard, entrepreneurs can create hybrid organizational forms, like franchising, that provide residual claimancy (Norton, 1988b). By replacing a salaried outlet manager with a residual claimant on the profits of a retail outlet, franchising reduces agency problems in selecting, assimilating, and monitoring new employees (Brickley & Dark, 1987).

Hybrid organizational arrangements reduce adverse selection as firms grow. Spence (1973) argued that individuals with above-average capabilities have an incentive to signal those capabilities to others. In franchising, qualified individuals can signal their capabilities by buying outlets. By buying a franchised outlet, an individual agrees to be compensated by the uncertain residual claim on the profits of that outlet. If the individual is qualified, this residual claimancy will provide a better return than the average wage rate paid to an employee. However, if the individual is not qualified, the compensation from residual claimancy will fall below that of the average wage rate. Therefore, qualified individuals will tend to see buying a franchise as more worthwhile than unqualified individuals. Although individuals may still have noneconomic incentives to misrepresent themselves when they buy franchises, qualified individuals are more likely to reveal their capabilities to entrepreneurs by purchasing franchised outlets. Consequently, franchising reduces the cost of determining the capabilities of outlet managers and thereby lowers the cost of firm growth.

The establishment of a hybrid organizational form like franchising is a better mechanism for establishing residual claimancy than the mechanism of paying salaried managers low salaries and large bonuses based on outlet profit. The purchase of a franchise outlet puts the franchisee's capital at risk if he or she chooses to shirk, creating a downside risk that performance bonuses do not provide.

Hybrid organizational forms also reduce the cost of deterring adverse selection in the assimilation of new managers into an organization. When individuals purchase franchised outlets, they seek to maximize the return on their investment. Therefore, the purchase of a franchised outlet provides an individual with an incentive to provide information about activities that

fit with their abilities, lessening the need for franchisors to incur costs to gather this information through other means. This provision of information lowers the cost of assigning new managers to jobs in the organization.

Hybrid organizational forms like franchising also reduce the cost of deterring moral hazard. Agents can engage in two types of moral hazard: suboptimal effort and misdirected effort. Since employees are paid a fixed wage, they have an incentive to put forth only as much effort as is necessary to ensure that they get paid. They also have an incentive to misdirect effort to personal goals like obtaining perks or leisure time.

Hybrid organizational forms like franchising do not reduce the problem of misdirected effort. Franchisees can, for example, focus on unit profits at the expense of company sales or free ride off the quality maintenance efforts of others. However, by turning individuals into residual claimants on the profits of their franchised outlets, franchising reduces the incentive to put forth a suboptimal effort level (Alchian & Demsetz, 1972).

Franchisees do not need to be monitored as carefully as employees since the latter need to be monitored for both suboptimal and misdirected effort (Krueger, 1991; Martin, 1988; Norton, 1988a, 1988b). Moreover, misdirected effort is less expensive to monitor than suboptimal effort since the latter is unobservable but the former can be observed and punished. Since it is less costly to monitor misdirected effort, franchising reduces the rate at which monitoring costs must rise as a firm grows and so allows the firm to grow faster. These arguments lead to the first hypothesis.

Hypothesis 1: The more a firm emphasizes franchising as its organizational form, the faster the firm will grow.

The achievement of efficient scale and survival. Hybrid organizational forms like franchising also increase the probability of a new firm's survival. They do so by allowing more rapid development of economies of scale. When franchise systems are new and small, they lack many of the economies of scale available to larger systems, such as those in purchasing materials, handling administrative overhead, and promoting their brand names. Since economies of scale exist in many activities in which franchisors engage, the larger the franchise system is, the lower the per-unit cost of operating it (Martin, 1988). When new franchisors enter industries in which they face established competitors, the speed with which they grow to a size at which they can operate at a competitive cost is important. Until they reach the minimum efficient number of outlets at which they can operate at a competitive per-outlet cost, new franchise systems are at a competitive disadvantage vis-à-vis established systems (Martin & Justis, 1993). The survival of new systems therefore depends on their ability to grow to the number of outlets at which they can develop a competitive cost structure before they run out of cash (Carney & Gedajlovic, 1991). By allowing firms to grow more rapidly, hybrid organizational forms like franchising increase the likelihood that companies will reach a size at which they can operate competitively before they experience cash flow problems that would cause them to fail (Martin &

Justis, 1993; Mathewson & Winter, 1985; Norton, 1988a). This argument leads to the second hypothesis.

Hypothesis 2: The more a firm emphasizes franchising as its organizational form, the greater will be the likelihood of its survival.

METHODS

Sample

This study examined 138 firms that first offered franchise-offering documents in the United States in 1983 over ten years. The data were compiled from *Franchise Annual* and *Entrepreneur Magazine*, two publications that attempt to obtain franchise-offering documents from all firms that they can identify as franchisors. Previous research has shown that the data provided by these sources are unbiased (LaFontaine, 1992; Michael, 1993).

To verify the accuracy of the sample, I asked officials at the Federal Trade Commission if their records indicated any additional franchisors that started in 1983. They knew of none. Given that *Franchise Annual* and *Entrepreneur Magazine* are important sources of free advertising to attract new franchisees and that the Federal Trade Commission seeks to ensure that all new franchisors comply with its regulations to provide disclosure documents to potential franchisees, I argue that the sample of firms studied is representative of the population of franchisors that began to franchise in the United States in 1983 and may, in fact, be the entire population.

The firms were drawn from a range of industries. Table 1 shows the distribution of firms by four-digit Standard Industrial Classification (SIC) code.

Models

Two types of regression models were used in this study. To explain growth (Hypothesis 1), I employed an ordinary-least-squares (OLS) regression model that predicted the rate of growth in the number of outlets in a franchise system. To explain survival (Hypothesis 2), a logistic regression model that predicted survival of the franchise system using the same independent variables was used. Growth and survival were measured over time periods ranging from one to ten years. Multiple years were used to demonstrate that the results were robust to the specification of the time period under investigation.

Dependent Variables

Franchisor performance could be measured in a number of different ways: in terms of survival, value-added, sales, profit, employment, or growth in the number of franchised and company-owned outlets in a franchise system (Evans, 1987; Martin & Justis, 1993). This study focused on growth in the number of franchised and company-owned outlets rather than other measures of performance for three reasons. First, growth in the number of franchised and company-owned outlets has been found to be a more robust

TABLE 1
The 1983 Cohort of New Franchise Systems

Industry Group	Four-Digit SIC Code	Number of Firms
Miscellaneous publishing	2741	3
Commercial printing	2759	3
Travel agencies	4724	1
Lumber and other building materials dealers	5211	9
Hardware stores	5251	6
Grocery stores	5411	4
Retail bakeries	5461	2
Auto and home supply stores	5531	1
Women's clothing stores	5621	2
Miscellaneous apparel and accessory stores	5699	1
Furniture stores	5712	1
Household appliance stores	5722	1
Computer and computer software stores	5734	7
Record and prerecorded tape stores	5735	4
Eating places	5812	24
Drug stores and proprietary stores	5912	2
Used merchandise stores	5932	2
Sporting goods stores and bicycle shops	5941	1
Jewelry stores	5944	1
Hobby, toy, and game shops	5945	1
Camera and photographic supply stores	5946	5
Sewing, needlework, and piece goods stores	5949	2
Catalog and mail-order houses	5961	3
Miscellaneous retail	5999	4
Beauty shops	7231	1
Shoe repair shops and shoeshine parlors	7251	2
Funeral service and crematories	7261	1
Miscellaneous personal services	7299	1
Outdoor advertising services	7312	1
Credit reporting services	7323	1
Photocopying and duplicating services	7334	4
Secretarial and court reporting services	7338	1
Building cleaning and maintenance services	7349	3
Equipment rental and leasing	7359	1
Employment agencies	7361	5
Information retrieval services	7375	1
Security system services	7382	3
Passenger car rental	7514	1
Top, body, and upholstery repair shops	7532	2
General automotive repair shops	7538	2
Automotive repair shops	7539	3
Offices and clinics of doctors of medicine	8011	1
Offices and clinics of doctors of dentistry	8021	2
Data processing schools	8243	4
Business associations	8611	3
Accounting, auditing, and bookkeeping services	8721	2
Business consulting services	8748	3

measure of franchisor growth than growth in sales, growth in assets, or growth in employment (Martin & Justis, 1993). Second, the use of the number of franchised and company-owned outlets makes the results of this study comparable to those of previous research on franchising that used this measure. Third, measures of financial performance were not available to me.

The dependent variable *growth* was defined as the logarithm of the change in the number of outlets in a system from 1983 to the year under investigation. (A logarithmic transformation was used since the raw data were not normally distributed.) Since some of the franchisors had negative growth, a constant of 55 was added to all cases so a log transformation could be calculated. After the transformation had been undertaken, the dependent variable was normally distributed. Analysis revealed no skewness or kurtosis. To confirm these results, growth was also measured in percentage terms. The results were the same as those reported here.

In the regression analysis, the dependent variable *survival* was defined as the existence of the organization in the year under investigation. Firms that were listed in *Franchise Annual* or *Entrepreneur Magazine* in a given year were categorized as survivors. Firms were categorized as nonsurvivors in a given year if three conditions were met: (1) they were not listed in the noted sources, (2) attempts to contact them at their last known addresses or telephone numbers or at forwarding addresses or telephone numbers failed, and (3) information about the firms did not appear in *Franchise Annual* or *Entrepreneur Magazine* in any subsequent year. In no case did a firm that was categorized as nonsurviving show up in later years of *Entrepreneur Magazine* or *Franchise Annual*. It is important to note that this technique did not confirm nonsurvival, but only disproved survival. However, given the multiple conditions for categorizing firms as nonsurvivors, the accuracy of this categorization is probably extremely high.

In addition, none of the franchise systems in the sample had been acquired or had changed names. I verified this condition by contacting the founders of the firms in the sample.

Independent Variables

The predictor variable in this study was the relative emphasis of a firm on expansion through franchising. This study's argument is that the use of franchising will allow a firm to grow faster than would be the case if it grew through the establishment of company-owned outlets. Since growth is important in many industries in which scale economies exist, the use of franchising also enhances the survival rate of firms. To measure *strategy*, I used the ratio of the number of new franchised outlets established to the number of new company-owned outlets established for the period prior to the one under study. For example, to predict growth and survival over ten years, I divided the number of franchised outlets created during the first nine years of franchising by the number of company-owned outlets created during the same nine years. For growth and survival over three years, this variable was measured as the number of franchised outlets created during

the first two years of franchising divided by the number of company-owned outlets created during those years.

This measure captures the realized expansion strategy of a franchisor while controlling for the quality of the business concept. For example, if the expansion strategy of the franchisor is to grow through equal emphasis on the establishment of franchised and company-owned outlets, this measure of strategy would be the same whether the business concept proved popular and 100 outlets of each type were established each year or unpopular and only one franchised and one company-owned outlet were established each year.

To ensure that a divisor of zero never occurred in the calculations of the strategy variable, I added a constant of 0.1 to both the numerator and the denominator before division. The robustness of this technique was demonstrated by the use of an alternative approach that dropped all cases for which there was a divisor of zero. The analysis of the data using the restricted sample yielded the same results as when a constant was added, demonstrating the robustness of the latter technique.

To ensure the robustness of the strategy measure, I also calculated it as the number of new franchised outlets established in the first year of franchising divided by the number of new company-owned outlets established in that year and as the number of new franchised outlets established in the first two years of franchising divided by the number of new company-owned outlets established in those two years. The results remained the same when these alternative measurements of strategy were used.

Control Variables

The study employed four sets of control variables.¹

Age. The absolute number of years that a firm was in existence at the time franchising began was controlled. New firms have a higher probability of failure than do established firms since the former have not yet developed organizational routines and repertoires or built trust or legitimacy with stakeholders (Aldrich & Auster, 1986; Stinchcombe, 1965). In the context of franchising, this means that the franchisor has not spent time developing and proving the business concept and its replicability before starting to franchise (Castrogiovanni, Justis, & Julian, 1993).

Pricing variables. Three pricing variables were controlled in this study: *franchise fees*, *advertising rate*, and *initial investment*. Royalty rates were not included because the initial investigation revealed that they correlated 0.96 with franchise fees. Therefore, franchise fee and royalty rate appear to be measuring the same variable: compensation to franchisor for the use of

¹ I also ran the analysis with two other controls for industry: industry averages for the pricing variables and a dichotomization of industry into those with repeat customers and those without. Since none of the additional control variables were significant or changed the predictor variable, I have not included them; results are available upon request.

its knowledge. The franchise fee is the sum paid by a franchisee to a franchisor upon signing the franchise agreement. The initial investment is the sum of money required to purchase the inventory, leasehold improvement, and other items that are necessary to open an outlet. The advertising rate is the percentage of sales that franchisees pay to franchisors for advertising. All three variables were measured as the deviation from the average for the cross section of all existing franchisors in the same four-digit SIC code in 1983 (firm/average). The averages were based on samples of at least ten firms since there were at least ten franchisors in each of the four-digit SIC codes in 1983.

These variables were controlled because they influence the supply-demand trade-off for the purchase of franchised outlets. The greater the price of an outlet, the greater the franchisor's incentive to favor franchising over company ownership in its expansion efforts. If franchising facilitates growth and survival, then high prices should enhance both growth and survival.

However, the higher the price a franchisor demands, the less likely potential franchisees will be to purchase its franchises. If high prices reduce the ability to attract franchisees, they should depress growth and survival. Given these conflicting influences, one cannot know *ex ante* if the pricing variables should have a positive, negative, or neutral effect on growth and survival. Nevertheless, since the pricing variables can be expected to have an effect, they were controlled.

Company-owned outlets. The number of *company-owned outlets* established by a firm prior to beginning franchising was controlled for two reasons. First, the economies of scale necessary to compete efficiently in franchising might depend on the total number of outlets in a system, including company-owned ones. The more company-owned outlets the firm has when it begins to franchise, the less quickly it has to grow to reach a competitive size (Castrogiovanni et al., 1993). Therefore, firms that are larger at the time franchising starts should grow more slowly than other firms. Second, the liabilities of size indicate that large firms are less likely to fail than small firms (Aldrich & Auster, 1986). Therefore, failure rates should be lower for firms that begin franchising from a larger base of company-owned outlets. This variable was measured as the actual number of company-owned outlets in a system at the time franchising began.

Industry growth rate. *Industry growth rate* was defined as the percentage rate of growth in the number of establishments for all firms (franchisors or not) in the franchisor's four-digit SIC code in the 1978-83 period. This measure was calculated from data collected from *County Business Patterns*. It is based on a sample of at least 750 establishments for each four-digit SIC code. Industry growth rate was controlled because differences in industry growth rates influence the munificence of the market niche that a firm is trying to exploit by franchising.

RESULTS

Table 2 shows that most new franchise systems die within ten years of establishment. This finding suggests the importance of identifying the factors that allow entrepreneurs to overcome managerial limits to firm growth.

TABLE 2
Survival Percentages of New Franchise Systems Started in 1983

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Percentage surviving	100.0	95.7	74.6	59.4	42.8	42.0	38.4	29.7	27.5	26.8	24.6

Table 3 shows the means, standard deviations, and correlations among the independent variables in the regression equations. The average firm in the population was 3.5 years old when it began to franchise and had 3.5 company-owned outlets. The advertising rate was 1 percent, the mean initial investment was \$94,442, and the franchise fee averaged \$16,993. All of these figures are lower than those that would be found in a cross section of surviving franchisors.

The correlation matrix indicates that there are no problems of multicollinearity between the independent variables. The highest correlation between two independent variables is .34, occurring between age (years of experience at the time franchising began) and the number of company-owned outlets at the time franchising began. In addition, an examination of the condition numbers and the variance inflation factor showed that multicollinearity was not a problem in this data set. (See Kennedy [1985] for an explanation of these measures of multicollinearity.)

Table 4 shows the results of the ordinary-least-squares regression analyses explaining the variation in growth across the 138 companies. The results shown in this table provide support for Hypothesis 1. Regression equations for all ten time periods (from one year through ten years) are shown for each model. The *F*-values indicate that for all time periods, the regressions predicting firm growth are significantly different from zero at the $p < .01$ level or better. The R^2 values indicate that for all years, the regression equations explain a significant amount of the variance in the rate of firm growth. The significance of strategy for all years indicates that expansion through franchising is positively associated with firm growth.

Table 5 shows the results of logistic regression analyses predicting franchise system survival. The results shown in this table provide support for

TABLE 3
Means, Standard Deviations, and Correlations

Variables	Mean	s.d.	1	2	3	4	5	6
1. Strategy	84.15	470.06						
2. Industry growth rate	0.27	0.18	-.04					
3. Age	3.49	5.99	-.06	.06				
4. Franchise fee	1.80	12.48	-.01	-.03	-.05			
5. Advertising rate	1.43	1.79	.02	-.04	.00	.16		
6. Initial investment	0.83	1.06	.01	-.17	-.04	.13	.24	
7. Company-owned outlets	3.54	30.12	-.02	.01	.34	-.01	-.04	-.07

TABLE 4
Results of OLS Regression Analyses Predicting Growth

Variables	1993		1992		1991		1990		1989		1988		1987		1986		1985		1984	
	β	t	β	t	β	t	β	t	β	t	β	t	β	t	β	t	β	t	β	t
Strategy	.51	6.96**	.54	7.57**	.51	7.00**	.53	7.33**	.48	6.30**	.59	8.35**	.60	8.61**	.46	5.90**	.50	6.51**	.70	12.29**
Company-owned outlets	.18	2.28†	.19	2.45*	.19	2.40*	.18	2.44*	.13	1.59	.12	1.67†	.09	1.28	.02	0.29	.02	0.30	.30	5.28**
Franchise fee	-.03	-0.40	-.03	-0.39	-.03	-0.40	-.03	-0.43	-.03	-0.35	.03	0.41	.03	0.46	.04	0.51	.05	0.52	.12	2.03†
Advertising rate	.13	1.65	.12	1.56	.12	1.45	.12	1.55	.07	0.84	.08	1.08	.07	0.97	.07	0.85	.12	1.51	.07	1.13
Industry growth rate	-.07	-0.88	-.07	-1.00	-.06	-0.82	-.04	-0.51	-.05	-0.63	-.02	-0.27	-.00	-0.06	-.07	-0.88	-.04	-0.53	-.05	-0.94
Age	-.01	-0.08	-.02	-0.22	-.01	-0.17	-.02	-0.26	-.03	-0.33	-.04	-0.55	-.03	-0.38	-.03	-0.32	.01	0.18	-.03	-0.43
Initial investment	-.08	-1.10	-.08	-1.07	-.08	-1.00	-.06	-0.81	-.05	-0.61	-.05	-0.70	-.06	-0.79	-.07	-0.86	-.04	-0.54	-.06	-0.87
F	8.41**		9.69**		8.43**		9.04**		6.30**		11.22**		11.58**		6.06**		6.88**		27.51**	
R ²	.28		.31		.28		.29		.21		.34		.35		.23		.23		.58	

† $p < .10$ * $p < .05$ ** $p < .01$

TABLE 5
Results of Logistic Regression Analyses Predicting Survival

Variables	1993		1992		1991		1990		1989		1988		1987		1986		1985		1984	
	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p
Strategy	0.04	.02	1.08	.00	4.65	.02	2.75	.05	0.04	.01	1.47	.00	1.71	.00	0.03	.03	1.33	.00	0.35	n.s.
Company-	0.01	n.s.	0.02	n.s.	0.02	n.s.	0.02	n.s.	0.01	n.s.	0.01	n.s.	0.01	n.s.	0.01	n.s.	0.01	n.s.	0.44	n.s.
owned outlets																				
Franchise fee	-0.01	n.s.	-0.01	n.s.	0.00	.09	0.06	n.s.	-0.02	n.s.	0.09	n.s.	0.38	.10	0.08	n.s.	0.18	n.s.	0.00	n.s.
Advertising rate	-0.07	n.s.	-0.05	n.s.	-0.35	n.s.	-0.13	n.s.	-0.05	n.s.	-0.02	n.s.	-0.08	n.s.	0.02	n.s.	-0.07	n.s.	0.78	n.s.
Industry growth	0.36	n.s.	1.04	n.s.	0.97	n.s.	-0.92	n.s.	0.25	n.s.	-0.33	n.s.	-0.86	n.s.	-1.23	n.s.	2.46	n.s.	-1.96	n.s.
rate																				
Age	0.06	.07	0.07	.08	0.08	.08	0.06	n.s.	0.04	n.s.	0.07	.07	0.07	.05	0.02	n.s.	0.07	n.s.	0.24	n.s.
Initial	-0.07	n.s.	0.22	n.s.	0.00	n.s.	0.36	n.s.	-0.04	n.s.	0.15	n.s.	0.18	n.s.	0.04	n.s.	0.17	n.s.	-0.13	n.s.
investment																				
Chi-square	42.47	.00	94.89	.00	114.20	.00	102.18	.00	37.37	.00	108.56	.00	116.89	.00	25.49	.00	63.96	.00	13.57	.06

Hypothesis 2. Regressions for all ten time periods are shown for each model. The chi-square values indicate that the regressions predicting firm survival are significantly different from zero at the $p < .01$ level or better for all periods except 1984. The significance of strategy for all but one year indicates that expansion through franchising is positively associated with firm survival. The lack of significant results for the first year might be explained by initial endowments of resources. Most new ventures begin with sufficient resources to survive an unfavorable start period. Therefore, new franchisors are likely to survive for the first year, regardless of the strategy they adopt.

DISCUSSION

The results of this study indicate that the use of franchising enhances firm survival and growth. This finding is particularly significant given that the failure rate of new franchise systems approximates that of new organizations.

The design of this study amplifies confidence in this finding. The data are extremely good, and causality can be inferred from the data since the independent variables were measured at an earlier time than the dependent variables. In addition, the analysis controlled for many factors that other studies have found to affect franchising.

Franchising Research

The results of this study have direct implications for research on franchising. Much of this research has looked at the phenomenon from a static perspective and has focused on the contextual factors that determine the relative efficiency of franchising and company ownership. This study indicates that this perspective is necessary but not sufficient to explain the emphasis that firms place on franchising. Researchers need to consider the relative efficiency of franchising and company ownership over time as well as space. This study suggests that a dynamic dimension should be added to the central thrust of Rubin's (1978) explanation of the static contextual factors favoring franchising over company ownership. Future research should consider the conditions under which franchising is more efficient than company ownership over time by examining such things as path dependent patterns in expansion strategies (Carney & Gedajlovic, 1991) or the timing of decisions to buy back franchised outlets (Brickley, Dark, & Weisbach, 1991).

Future research should also consider why the pricing, age, industry, and company-owned outlets variables do not explain the performance of new franchise systems. One possible explanation for the lack of significance of the pricing variables is that their positive effects on franchisor behavior and their negative effects on franchisee behavior might have canceled each other out. Another possible explanation is that franchisees might have perceived high franchise fees and royalty rates as signals of system quality and potential return on investment. Therefore, the inverse relationship between price and demand might have been offset by expectations of higher returns.

Several explanations can be posited for the lack of significance for industry: One is that the growth of the overall industry does not reflect the growth

of the segment in which a franchise system competes. Another is that the quality and strategy of the franchise system was of such central importance to system growth that overall industry growth rates did not matter much. The inconsistent significance for age and company suggests that prior experience developing and proving the replicability of the franchise concept does not influence the growth and may not influence the survival of a franchise system. It may be that franchising is such a different activity from operating a business that capabilities developed from operating a business do not aid in the growth and survival of the firm when it turns to franchising.

The relatively low amount of variance explained in this study suggests that other factors also influence the performance of new franchisors. One possible area for future research to address is the replicability of a business concept. Franchising research to date has focused heavily on issues of resource constraints and control mechanisms. However, one of the defining attributes of franchise systems is that they create a set of independent but identical organizations. Therefore, the ease of replicating a business concept may explain some of the variance in the performance of new franchisors. Another possible area to consider is the quality of franchisor support to a franchisee. The ability to transfer entrepreneurial knowledge to franchisees without diffusing it to potential competitors may explain some of the variance in the performance of new franchisors. A third possible area for future research may be industry characteristics. Although this study showed that environmental munificence did not explain the growth or survival of new franchisors, other industry factors, like complexity of the business concept, technology, or geographic market heterogeneity, may explain some of the variance in the performance of new franchisors.

Research on Firm Growth

The results are also important to research on firm growth. Although many scholars have argued that managerial limits to firm growth exist (Mahoney & Pandian, 1992; Penrose, 1959; Slater, 1980; Williamson, 1967), agency theorists have suggested that entrepreneurs can overcome these limits by turning employment relationships into residual claimancies. This study shows that one type of hybrid organizational form, franchising, allows entrepreneurs to overcome some managerial limits to firm growth. These results are consistent with the observation that firms "use franchising when they want to grow faster, implying that franchising allows franchisors to relax some form of constraint on their growth" (LaFontaine, 1992: 281). Supporting the initial observations of Norton (1988a), this study demonstrates that franchising is important because of its effect on overcoming managerial limits to firm growth.

The findings suggest that, by incorporating Penrose's (1959) observation that firm growth is constrained by the speed at which a firm can expand its managerial capacity, the resource-based view of the firm may be unduly constraining in its view of the managerial limitations to firm growth. This study shows that hybrid organizational forms like franchising allow firms to

overcome some of these managerial limits. Therefore, franchising offers a means by which the internal managerial capacity of a firm can be leveraged to produce more rapid growth than would be possible in the absence of that leverage.

These findings raise the question of whether the managerial-limit-overcoming properties present in franchising are also found in other hybrid organizational forms, like licensing or strategic alliances. Research to date suggests that new organizations often use hybrid organizational forms to grow large enough and quickly enough to develop global products, create new technologies, and beat competitors to market (Ohmae, 1989). These new organizational forms include networks of subcontracts, licensing relationships, and strategic alliances (Quinn & Paquette, 1990). This previous research implies that managerial limits to organizational growth combined with intense pressure to grow large quickly lead many organizations to rely less on their own capabilities and more on co-capabilities developed or shared with other firms. In combination with the results of the present study, this previous research suggests that hybrid organizational forms, in general, may be valuable when firms want to grow faster than the rate of expansion of their managerial capacity.

Franchising Practitioners

The results of the present study also have important implications for franchising practitioners. The study indicates that entrepreneurs can achieve higher rates of growth if they engage in franchising than if they expand through company ownership of retail outlets. A rapid growth rate and the achievement of large size are important to entrepreneurs in industries in which market power and economies of scale exist. This study provides evidence of a method by which entrepreneurs can enhance the speed with which they can achieve these advantages.

The findings also lead to practical implications for someone considering investment in a franchise system (as a potential franchisee or portfolio investor). First, investors should be aware that the establishment of a franchise system is not a low-risk proposition. Over three-quarters of all new franchise systems fail within ten years. Second, the franchise systems most likely to grow and survive emphasize the sale of outlets. Third, prior experience managing a particular business appears to have little effect on the subsequent growth and survival of a franchise system. Potential investors should be aware that the skills that new franchisors develop in managing a business may not help them to develop a better franchise system.

Conclusion

This article has shown that firms can overcome managerial limits to firm growth and can enhance the probability that they will survive and grow by expanding through contractual organizational forms like franchising. My hope is that this study will spur other researchers to explore factors that explain more about hybrid organizational forms. Given the growing impor-

tance of hybrid organizational forms to American business, this research would be a valuable addition to the field of management.

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STYLE GUIDE FOR AUTHORS

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Submit five copies of the manuscript; be sure that they are good, clear copies and that each copy includes all pages. The manuscript should be typed on standard-sized (8½" × 11") paper and *double-spaced throughout*—including footnotes, references, appendixes, tables, and figures. Only upper- and lowercase type of ordinary size and density should be used: no bold or extra large or small type. Type on only one side of the paper, and use wide margins (one inch or more) at top, bottom, and both sides of each page. There is no absolute limit, but the length of articles should not ordinarily exceed 30 manuscript pages, including references, appendixes, tables, and figures.

Title Page, Abstract, and Page Numbering

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Acknowledgments

An unnumbered footnote can be used to acknowledge financial support and the assistance of others in the reported research. The text for this footnote should appear at the bottom of page 2.

Footnotes

Footnotes should be used sparingly. Minimize their use for parenthetical discussion; material that is pertinent can often be integrated into

the text. They should not be used for citing references (see References, below). The text for all footnotes should appear on a separate page or pages at the end of the body of the article.

Headings

Main headings should be used to designate the major sections of an article; three or four main headings should be sufficient for most articles. Initial headings, such as "Introduction," are unnecessary. Main headings should be centered on the page and typed in all capitals. Example:

METHODS

Secondary headings should be typed flush with the left margin and in small letters, with major words beginning with capitals. Example:

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Third-order or paragraph headings should begin with a standard paragraph indentation and be typed in small letters, with only the initial word capitalized, and followed by a period. The text should follow on the same line. Example:

Manager sample. Respondents consisted of a random sample of 300 managers. . . .

Tables and Figures

Useful tables and figures do not duplicate the text; they supplement and clarify it. Because tables and figures are considerably more expensive to prepare for publication than text, the degree to which they add to the impact of an article should be considered carefully.

Each *table* should be typed, double-spaced, on a separate page. Tables should be grouped following an article's appendixes. (If there is no appendix, tables follow the references.) Each table should have the word TABLE (typed in all caps) and its number (arabic numerals) centered at the top. The table's title should be in capital and small letters and centered on the page directly under the table number. Example:

TABLE 2
Results of Regression Analysis

Tables should be numbered consecutively from the beginning to the end of the article. A table's position in a manuscript should be indicated in the text as follows:

Insert Table 2 about here

For most articles, the first table should report descriptive statistics, including means, standard deviations, and a complete correlation matrix. These statistics should have two decimal places and decimal points. Correlations should fill the lower left corner of the page.

Each table should report the results of one type of analysis. Headings should be ranged across the top of the table. No new headings should appear in the body of the table. Complete names of variables—not abbreviations or computer code names—should be used.

If it is necessary to distinguish some numerals in a table from others (for example, to indicate which factor loadings define a factor), boldface type can be used. In the manuscript, underline a numeral that should be set bold with a wavy line. This possibility should not be used when other conventions, such as footnotes, are sufficient.

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- (2) Footnotes that indicate a level of significance should follow any other footnotes and be designated by one or more asterisks: * for $p < .05$, ** for $p < .01$, and *** for $p < .001$. Use a dagger symbol (†) for $p < .10$.

Figures are illustrations, not tables. Authors should be prepared to supply finished camera-ready artwork for all figures at the time the manuscript is accepted for publication. The spacing and lettering used in figures should allow for the possibility that they will be reduced in size by as much as 50 percent so that they will fit the size of the *Journal's* page. Figures should be numbered and titled like tables (see above) and grouped after the tables in a manuscript. Each figure's position in the article should be indicated in the same way as each table's position.

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An alphabetically ordered list of the references cited in the text should be included at the end of an article. References should begin on a separate page headed REFERENCES. Continue the pagination.

Entries in the list of *references* should be alphabetized by the last name of the author (first author if more than one) or editor, or by the corporate author (U.S. Census Bureau) or periodical name (*Wall Street Journal*) if there is no indication of individual authors or editors. Several references by an identical author (or group of authors) are ordered by year of publication, with the earliest listed first. Multiple references to works by one author or group of authors with the same year of publication should be differentiated by adding small letters (a, b, etc.) after the year. Authors' names are repeated for each entry.

Citations to references should be designated throughout the text by enclosing the authors' names and the year of the reference in parentheses. Example:

Several studies (Adams, 1974; Brown & Hales, 1975, 1980; Collins, 1976a, 1976b) support this conclusion.

Note the use of alphabetical order and ampersands in citations.

Citations to the source of a direct quotation must give a page number or numbers; these follow the date of publication given in parentheses and are separated from it by a colon. Example:

Adams has said that writing a book is "a long and arduous task" (1974: 3).

Page numbers should also be cited when specific arguments or findings of authors are paraphrased or summarized. As indicated in the example, if the name of the author occurs in the body of a sentence, only the year of publication is cited. Otherwise, both name and date appear in parentheses, separated by a comma.

If a work has two authors, always cite both names every time the work is cited in the text. If the work has more than two authors, cite all authors the first time the reference occurs; in subsequent citations of the same work, include only the name of the first author, "et al.," and the year. Examples:

Few field studies use random assignment (Franz, Johnson, & Schmidt, 1976).
(first citation)

... even when random assignment is not possible (Franz et al., 1976: 23).
(subsequent citation)

However, for works with six or more authors, use only the name of the first author and "et al." whenever the work is cited.

Book entries in the list of references follow this form: Authors' or Editors' Last Names, Initials. Year. Title of book. (Book titles are underlined and typed in lowercase letters except for the first word and the first word after a colon.) City Where Published, State or Country (add only if needed to identify the city and use U.S. Postal Service abbreviations for states): Name of Publisher. Please note and follow the punctuation used in these and subsequent examples:

Boulding, K. E. 1956. The image. Ann Arbor: University of Michigan Press.

Kahn, R. L., & Boulding, E. (Eds.). 1964. Power and conflict in organizations. Glencoe, IL: Free Press.

Katz, D., & Kahn, R. L. 1978. The social psychology of organizations (2d ed.). New York: Wiley.

U.S. Department of Labor Statistics. 1976-1983. Employment and earnings. Washington, DC: U.S. Government Printing Office.

Periodical entries follow this form: Authors' Last Names, Initials. Year. Title of article or paper (in lowercase letters except for the first word and the first word after a colon). Name of Periodical, volume number (issue number): page numbers. Examples:

Fry, L. W., & Slocum, J. W., Jr. 1984. Technology, structure, and workgroup effectiveness: A test of a contingency model. Academy of Management Journal, 27: 221-246.

Goggin, W. C. 1974. How the multidimensional structure works at Dow Corning. Harvard Business Review, 55 (1): 54-65.

An issue number should be included only if a periodical's pages are not numbered consecutively throughout the volume—that is, if each issue begins with page 1.

If a periodical article has no author, the name of the periodical should be treated like a corporate author, both in citations and in the references. Example:

There is fear that Social Security rates may rise (Wall Street Journal, 1984).

Wall Street Journal. 1984. Inflation rate may cause Social Security increase. September 24: 14.

Chapters in books follow this form: Authors' Last Names, Initials. Year. Title of chapter (in lowercase except for the first word and first word after a colon). In Editors' Initials and Last Names (Eds.), Title of book: page numbers. City Where Published, State or Country (only if necessary to identify the city): Name of Publisher. Examples:

Berg, N. A. 1973. Corporate role in diversified companies. In B. Taylor & I. MacMillan (Eds.), Business policy: Teaching and research: 298–347. New York: Wiley.

Roberts, F. S. 1976. Strategy for the energy crisis: The case of commuter transportation policy. In R. Axelrod (Ed.), Structure of decision: 142–179. Princeton, NJ: Princeton University Press.

Unpublished papers, dissertations, and presented papers should be listed in the references using the following formats:

Duncan, R. G. 1971. Multiple decision-making structures in adapting to environmental uncertainty. Working paper no. 54–71, Northwestern University Graduate School of Management, Evanston, IL.

Smith, M. H. 1980. A multidimensional approach to individual differences in empathy. Unpublished doctoral dissertation, University of Texas, Austin.

Wall, J. P. 1983. Work and nonwork correlates of the career plateau. Paper presented at the annual meeting of the Academy of Management, Dallas.

Appendixes

Lengthy but essential methodological details, such as explanations of long lists of measures, should be presented in an appendix or appendixes. The material should be presented in as condensed a form as possible but not in a table format. A single appendix should be titled APPENDIX, typed in all caps; multiple appendixes are titled and ordered alphabetically: APPENDIX A, APPENDIX B, etc.

Biographical Sketches

At the time an article is accepted for publication, a brief biographical sketch of 50 words or less should be submitted for each author. It should indicate where the highest degree was earned, present position and affiliation, and current research interests. Example:

Andrea Barber earned her Ph.D. degree at the University of Wisconsin; she is an associate professor of management and the director of the Management Improvement Center at Famous University. Her current research interests include dual-career families and sociotechnical systems in organizations.

RESEARCH NOTES

Research notes contain brief descriptions of original research. To be considered for the Research Notes section, manuscripts should not exceed 15 double-spaced typewritten pages in length. A manuscript intended for this section should be prepared according to the instructions for articles, except that the abstract should not exceed 50 words in length.

GENERAL USAGE

Avoidance of Sexist and Other Biased Language

Authors should avoid terms or usages that are or may be interpreted as denigrating to ethnic or other groups. Authors should be particularly careful in dealing with gender, where long-established customs, such as the use of "he" as a generic pronoun ("a manager . . . he"), can imply gender-based discrimination. Using plural pronouns—changing the "client . . . he" to "clients . . . they"—is preferred.

Use of First Person

Vigorous, direct, clear, and concise communication should be the objective of all articles. Use of the first person and the active voice can further that objective.

SPECIAL RESEARCH FORUM CALL FOR PAPERS: MANAGERIAL COMPENSATION AND FIRM PERFORMANCE

The *Academy of Management Journal* is pleased to announce a call for papers for a special research forum on managerial compensation and firm performance. Guest co-editors will be Luis R. Gomez-Mejia and Harry Barkema.

This research forum is intended to improve our understanding of what determines managerial pay and how it interacts with internal and external forces to impact firm performance. Social scientists examining these issues have emphasized notions such as fairness, power relationships, networks, and internal structural factors. Agency theorists have emphasized pecuniary incentives and the role of corporate governance. Strategic management researchers have documented correlations between managerial pay, strategy, and performance. Others have argued that contextual factors, such as the market, situational risk, and institutional constraints, play a major role in explaining managerial pay and its organizational consequences. We invite you to lower the boundaries between these areas and provide more insight regarding the above research question.

In particular, this research forum would like to encourage novel empirical approaches to the study of managerial pay and firm performance. All papers must be empirical in nature. Although not restricted to specific topics, ideally submissions should fall in one or more of the following categories.

International. Almost all previous studies of managerial pay use U.S. data. Yet, the scarce evidence on other countries suggests important cross-country differences. Such unique configurations of national culture (e.g., notions of justice and fairness, work values), power systems, institutional controls, historical traditions, and the like are exciting areas to explore regarding the above research questions. Submissions may deal with a broad set of international issues such as the combined effect of economic and noneconomic (power, culture, etc.) factors as determinants of managerial pay; the interaction between managerial pay and country-specific forces (e.g., takeover market, large blockholders, financial institutions, industrial policy) as determinants of corporate and SBU strategy and performance; tests of relevant hypotheses using "in-depth" studies of individual countries or cross-country studies (e.g., can some managerial compensation strategies be used effectively on a universal basis, while others customized to meet the specific needs of diverse national cultures?); and so forth.

Interdisciplinary. The determinants of managerial pay and its effect on firm performance may be better understood by linking variables and models from different disciplines. As a whole, most of the extant research has originated in economics and finance. Submissions that can develop synthetic or integrated frameworks that bridge two or more disciplines to study the above research question are encouraged.

Innovative methodologies. With few exceptions, investigators examining the antecedents and consequences of managerial pay tend to rely on archival data available in *Compustat*, *Disclosure*, and other similar sources. One problem with the use of these databases is that researchers are constrained by the information included in them (e.g., data is reported for top five executives only), and large inferential leaps may need to be made when measuring certain constructs (e.g., stockholder influence). Submissions that use unconventional data sources and novel methodologies are encouraged.

In preparing manuscripts, authors should follow requirements specified in *AMJ*'s "Style Guide for Authors." Cover letters should request that papers be specifically considered for this special research forum. Five copies of the manuscript should be sent to Angelo DeNisi, *Academy of Management Journal*, Institute of Management and Labor Relations, Livingston Campus, Rutgers University, New Brunswick, NJ 08903-5062. Papers must be received no later than April 5, 1996, to be considered for this forum. All submissions will be blind reviewed in accord with *AMJ*'s normal review process and criteria.

SPECIAL RESEARCH FORUM CALL FOR PAPERS: TEACHING EFFECTIVENESS IN THE ORGANIZATIONAL SCIENCES

There has been increased attention to teaching as a legitimate scholarly activity in business schools. Professional organizations are providing financial and moral support for the development and recognition of teaching excellence. Deans and other university administrators now make teaching performance a priority in their reports and statements about progress in professional schools. Teaching is also being treated as equivalent to research for purposes of tenure and promotion in more and more previously research-dominated faculties. The dilemma is that teaching in business schools lacks much conceptual orientation and little systematic empirical research. We do not know a great deal about what it means to talk about good teaching and effective learning in the organizational sciences. We have not harnessed what we have learned about organizations as learning systems, political entities, arenas for leadership, and the like, to understand teaching performance and outcomes.

It is not clear what questions should be asked in order to conduct meaningful research on teaching in our field. Nevertheless, we are convinced that it is important to begin to focus on this research. Undoubtedly, there are lessons to be learned from research in the field of higher education. We need also to have a research base on teaching effectiveness from within our own field. We are inviting those interested to submit papers that report on innovative studies on teaching. We are *not* seeking studies that report simple correlations between teaching styles and performance and the like.

The following, while not definitive, are potential topics:

- What is the nature of effective teaching about the organizational sciences in an age of rapid change and technological innovation?
- Are there significant gains to learning that stem from computer-based instruction? What are the limits of such approaches?
- What is the role of power in the classroom? What is the nature of control in teaching? Are there systematic differences in teaching effectiveness, on learning based upon gender, ethnicity of instructors, of students?
- What factors are significant in the development of effective teachers?
- Are there lessons for teaching performance that emerge from theories and research on topics such as leadership, control, learning, and so forth?
- What are the effects of different learning experiences, such as planned teaching (e.g., in some case methods) versus improvised teaching? Can this be institutionally influenced? Does it make a difference when one method (e.g., planned or spontaneous) is overlearned by being the norm in a business school?
- What are the effects of internship/project versus classroom learning and are there contingent institutional influences involved?
- What is the nature of teaching evaluation, for example, the relationships between teaching performance and process, and evaluation of instructor outcomes and effectiveness?
- Are there viable, empirically grounded critical analyses of teaching in the organizational sciences?

We encourage naturalistic as well as laboratory studies, qualitative as well as quantitative methodologies. Our major concerns are to stimulate research that will provide thoughtful, imaginative, well-crafted studies on the teaching process and its outcomes.

In preparing manuscripts, authors should follow *AMJ's* "Style Guide for Authors." Cover letters should request that papers be specifically considered for this special research forum. Send five copies of the manuscript to Angelo DeNisi, *Academy of Management Journal*, Institute of Management and Labor Relations, Livingston Campus, Rutgers University, New Brunswick, NJ 08903-5062. Papers must be received no later than June 1, 1996. All submissions will be blind reviewed by an editorial board in accord with *AMJ's* normal process. For further information, contact Peter J. Frost, Canada, fax (604) 822-9516, phone (604) 822-8318, or Cynthia V. Fukami, USA, fax (303) 871-2294, phone (303) 871-2193.

SPECIAL RESEARCH FORUM CALL FOR PAPERS: THE SOCIOLOGY OF MANAGEMENT AS A SCIENCE

The *Academy of Management Journal* is pleased to announce a special research forum call for papers on the sociology of management as a science. Guest editor will be Arthur G. Bedeian.

Whereas the management discipline has long looked "outside" at the world of work, it has seldom looked at the nature of its own collective enterprise. In this respect, the growth of management as a discipline is not merely a function of scientific research, but is influenced by intellectual motives, norms of behavior, individual values, personal opportunities, social relationships, means of communication, and professional institutions. Within this context, the sociology of management is a reflection of an evolving and unique "scientific ethos." This ethos derives from a complex of prescriptions, mores, beliefs, and presuppositions whose content is difficult to describe.

It is perhaps because of this difficulty that the contents of this ethos are only seldom explicitly detailed (and less rarely elaborated in print). Thus, the purpose of the proposed forum is to explore the sociology of management as a science, with a focus on the ways in which scientific research and the diffusion of scientific knowledge within the management profession are influenced by its disciplinary paradigm. Preferred submissions will be those that address the management discipline as a scientific activity rather than as the study and application of concepts and theories.

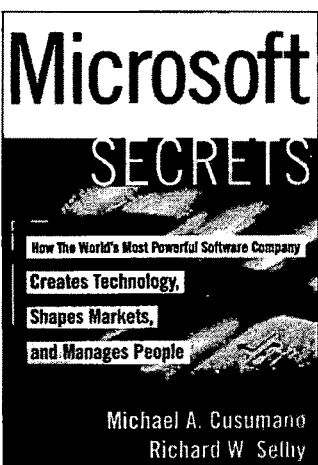
The following, while not inclusive, are potential topics:

- What norms and values are associated with the management discipline? How are they transmitted (e.g., via professional socialization, graduate training, precept, example)?
- What are the intellectual motives, networks of communication, webs of social influence, and academic/professional institutions associated with the creation of management knowledge?
- How do social pressures or conditions within the management discipline affect the consensus of opinion in favor of old or new conclusions?
- How does traditional training and indoctrination within the discipline influence the definition of research problems and methods of investigation?
- How does social/institutional stratification and competition within the discipline shape the roles and careers of management scholars?
- How do social conditions influence the selection of research issues, as well as the conceptual and logical structure of scientific arguments within the discipline?
- What is the relationship between the allocation of rewards in the discipline and the behavior expected of management scholars?

Established and novel empirical approaches are encouraged. Likewise, both conventional and iconoclastic perspectives are sought. Manuscripts that elaborate practical or theoretically based recommendations for advancing management as a science are especially desired.

Authors should follow *AMJ's* "Style Guide for Authors" in preparing manuscripts. Cover letters should request that manuscripts be specifically considered for this special research forum. Submit manuscripts to Angelo DeNisi, *Academy of Management Journal*, Institute of Management and Labor Relations, Livingston Campus, Rutgers University, New Brunswick, NJ 08903-5062. Manuscripts must be submitted in quintuplet and received no later than October 16, 1996. All submissions will be blind reviewed in accord with *AMJ's* normal process. For further information, contact Arthur G. Bedeian, Department of Management, Louisiana State University, Baton Rouge, LA 70803-6312, USA; fax: 01 (504) 388-6140; phone: 01 (504) 388-6141; Internet: mgbede@lsuvm.sncc.lsu.edu.

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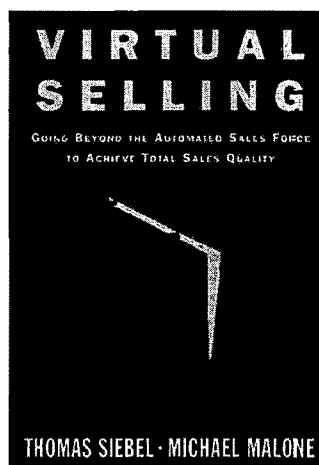
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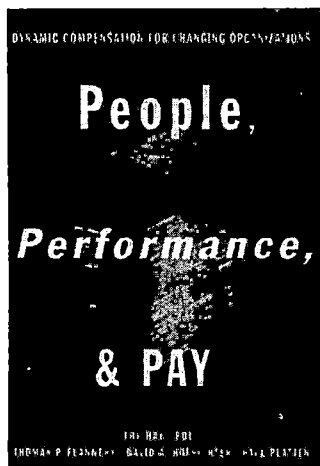
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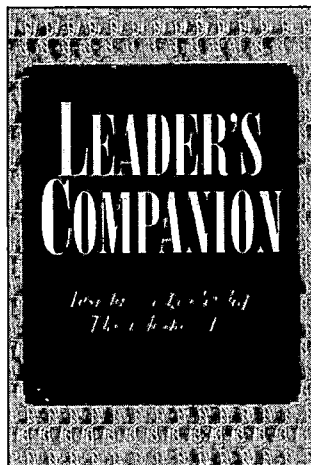
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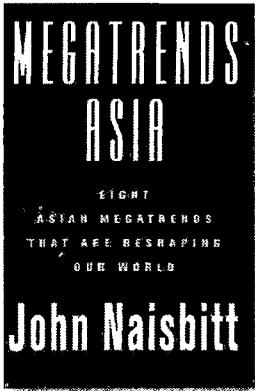


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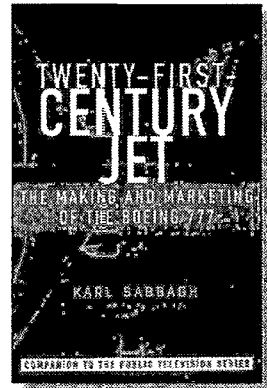
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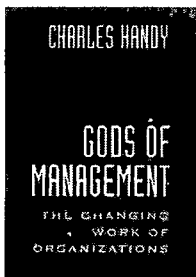
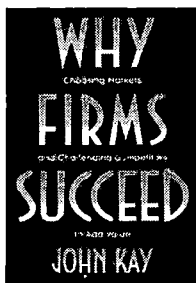
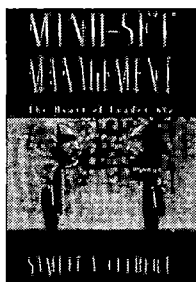
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Applications and nominations are invited for the position of dean of the School of Business Administration at Wayne State University.

The university is an urban Carnegie Research University I with more than 32,000 students (1,250 undergraduate and 1,730 graduate in business) located in Detroit. Fourteen colleges and their associated graduate and professional schools comprise the largest graduate/professional enrollment of any institution in the country.

The School of Business Administration is organized as four departments: Accounting, Finance and Business Economics, Management and Organization Science, and Marketing. The undergraduate and graduate programs are accredited by the American Assembly of Collegiate Schools of Business. In FY-96 the university budget supports 65 full-time-faculty roster positions, 18 graduate assistants, and seven administrative burden positions. The school offers the B.A./B.S. degree in business administration in five majors, the M.B.A. program, a master's in taxation, and plans to implement a multidisciplinary Ph.D. program. The school participates in three degree programs offered jointly with other colleges, and offers a variety of nondegree outreach programs to the local business community and several programs in international business development. The faculty and staff are housed in modern academic facilities on the WSU main campus and has external income derived from research, contract, and public service activities of \$1.7 million in FY-95.

The university seeks an innovative visionary individual with administrative/leadership excellence in academic or private sector settings and appropriate experience in related research and instruction programs. Desired characteristics include:

- Ability to articulate and advocate for the goals of the school within the university, the professional business community, and accreditation agency.
- Evidence of scholarly achievement or strong consistent record of accomplished success in business leadership.
- The ability to lead in a continuous quality improvement environment.
- Ability to work effectively with external advisory board and alumni leadership.
- Demonstrated commitment to academic excellence for diverse student populations at both the undergraduate and graduate levels.
- Demonstrated leadership skills reflecting ability to foster innovative research, education and fund-raising activities in partnership with the private sector.
- Experience appropriate for appointment at a professorial level in the university.
- Ability to develop interdepartmental, intercollegiate, and interinstitutional research teams.

Starting date is July 1, 1996. Candidates should submit a letter of application, curriculum vitae, and the names, addresses, and telephone numbers of at least three references. Screening of applicants will begin on February 1, 1996, and continue until the position is filled. Nominations and applications should be sent to: Dr. George C. Fuller, Chair, Search Committee, College of Pharmacy and Allied Health Professions, Wayne State University, Detroit, MI 48202.

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Academy of Management JOURNAL

CONTENTS

Volume 39, Number 3, June 1996

From the Editor 517

The Resource-Based View of the Firm in Two Environments: The
Hollywood Film Studios from 1936 to 1965
Danny Miller and Jamal Shamsie 519

Procedural Justice in Entrepreneur-Investor Relations
Harry J. Sapienza and M. Audrey Korsgaard 544

Information-Processing Demands as a Determinant of
CEO Compensation
Andrew D. Henderson and James W. Fredrickson 575

Employee Creativity: Personal and Contextual Factors at Work
Greg R. Oldham and Anne Cummings 607

Diversifying Entry: Some Ex Ante Explanations for Postentry Survival
and Growth
Anurag Sharma and Idalene F. Kesner 635

Foreign Subsidiary Compensation Strategy: An Agency
Theory Perspective
Kendall Roth and Sharon O'Donnell 678

RESEARCH NOTES

Outcomes of Perceived Discrimination Among Hispanic Employees:
Is Diversity Management a Luxury or a Necessity?
Juan I. Sanchez and Petra Brock 704

Corporate Political Strategy and Foreign Competition: The Case of the Steel Industry <i>Douglas A. Schuler</i>	720
Occupational Stress, Social Support, and the Costs of Health Care <i>Michael R. Manning, Conrad N. Jackson, and Marcelline R. Fusilier</i>	738
Agency Theory and Variable Pay Compensation Strategies <i>Linda K. Stroh, Jeanne M. Brett, Joseph P. Baumann, and Anne H. Reilly</i>	751

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FROM THE EDITOR

As I indicated to you in the last issue of *AMJ*, Anne Tsui will assume the editorship of the *Academy of Management Journal* effective January 1, 1997. She will serve as editor-elect and associate editor for the year 1996. During that time, we will begin the traditional transition as my term as editor winds down and she gears up for her own three-year odyssey. Therefore, effective July 15, 1996, all *new* manuscript submissions should be sent directly to Anne Tsui. Anne is presently on the faculty of both the University of California at Irvine and the Hong Kong University of Science and Technology. Since she is presently located in Hong Kong, to facilitate paper submissions send all manuscripts to the following address:

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The manuscripts will then be forwarded to Anne in Hong Kong, and she will proceed much as we have in the past. There is one other change, however; the need to send copies of papers on to Anne in Hong Kong necessitates an extra copy of each submission. Therefore, as of July 15, 1996, authors should submit *six* copies of all new submissions. Please refer to Information for Contributors for other submission requirements and guidelines.

As I also noted in the April issue, I will continue to process new submissions until July 15, 1996. After that, I will continue to process *revisions* only until December 31, 1996. After that date, I can no longer make any decisions regarding manuscripts submitted to the *AMJ*. I have contacted authors of papers for which we have requested revisions to notify them of this. I realize that authors often feel that they have established a "relationship" with an editor regarding their papers, so those who have begun the review process under my editorship may well want to complete the process while I am still editor. Surely, there are cases where that will not be possible and Anne will be making final decisions about papers originally submitted to me. Nonetheless, it is our intention to complete as many manuscripts as we can at our office, before my term as editor ends.

For now though, please join me in again congratulating Anne Tsui as she begins her term as the new editor of the *Academy of Management Journal*.

Angelo DeNisi

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THE RESOURCE-BASED VIEW OF THE FIRM IN TWO ENVIRONMENTS: THE HOLLYWOOD FILM STUDIOS FROM 1936 TO 1965

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This article continues to operationally define and test the resource-based view of the firm in a study of the major U.S. film studios from 1936 to 1965. We found that property-based resources in the form of exclusive long-term contracts with stars and theaters helped financial performance in the stable, predictable environment of 1936–50. In contrast, knowledge-based resources in the form of production and coordinative talent and budgets boosted financial performance in the more uncertain (changing and unpredictable) post-television environment of 1951–65.

The resource-based view of the firm provides a useful complement to Porter's (1980) well-known structural perspective of strategy. This view shifts the emphasis from the competitive environment of firms to the resources that firms have developed to compete in that environment. Unfortunately, although it has generated a great deal of conceptualizing (see reviews by Black and Boal [1994] and Peteraf [1993]), the resource-based view is just beginning to occasion systematic empirical study (Collis, 1991; Henderson & Cockburn, 1994; Montgomery & Wernerfelt, 1988; McGrath, MacMillan, & Venkatraman, 1995). Thus, the concept of resources remains an amorphous one that is rarely operationally defined or tested for its performance implications in different competitive environments.

In the interests of testing and advancing the application of the resource-based view, this research develops the distinction between property-based and knowledge-based resources. We argue that the former are likely to contribute most to performance in stable and predictable settings, whereas the latter will be of the greatest utility in uncertain—that is, changing and unpredictable—environments (Miller, 1988; Thompson, 1967). Indeed, in this article we attempt to move from a resource-based “view” toward a “theory” by progressing from description to testable prediction. A view is a product

We would like to acknowledge the helpful suggestions of Ming-Jer Chen, Steve Zyglidopoulos, and two anonymous reviewers.

of evocative description, but theory demands the formulation of falsifiable propositions.

THE NATURE OF RESOURCES

According to Wernerfelt, resources can include "anything that might be thought of as a strength or weakness of a given firm" and so "could be defined as those [tangible and intangible assets] which are tied semipermanently to the firm" (1984: 172). Resources are said to confer enduring competitive advantages to a firm to the extent that they are rare or hard to imitate, have no direct substitutes, and enable companies to pursue opportunities or avoid threats (Barney, 1991). The last attribute is the most obvious: resources must have some value—some capacity to generate profits or prevent losses. But if all other firms have them, resources will be unable to contribute to superior returns: their general availability will neutralize any special advantage. And for the same reason, readily available substitutes for a resource will also nullify its value. Thus, resources must be difficult to create, buy, substitute, or imitate. This last point is central to the arguments of the resource-based view (Barney, 1991; Lippman & Rumelt, 1982; Peteraf, 1993). Unusual returns cannot be obtained when competitors can copy each other. Thus, the scope of this study will be limited strictly to nonimitable resources.

Clearly, there are many resources that may meet these criteria, albeit with differing effectiveness under different circumstances: important patents or copyrights, brand names, prime distribution locations, exclusive contracts for unique factors of production, subtle technical and creative talents, and skills at collaboration or coordination (Black & Boal, 1994).

There are a number of ways in which the resource-based view can be further developed. First, it may be useful to make some basic distinctions among the *types* of organizational resources that can generate unusual economic returns. By specifying the distinctive advantages of different types of resources, it may be possible to add precision to the research. Such distinctions will help avoid vague inferences that impute value to a firm's resources simply because it has performed well (cf. Black & Boal, 1994; Fiol, 1991).

Second, to complement its internal focus, the resource-based view needs to delineate the external environments in which different kinds of resources would be most productive. Just as contingency theory attempts to relate structures and strategies to the contexts in which they are most appropriate (Burns & Stalker, 1961; Thompson, 1967), so too must the resource-based view begin to consider the contexts within which various kinds of resources will have the best influence on performance (Amit & Schoemaker, 1993). According to Porter, "Resources are only meaningful in the context of performing certain activities to achieve certain competitive advantages. The competitive value of resources can be enhanced or eliminated by changes in technology, competitor behavior, or buyer needs which an inward focus on resources will overlook" (1991: 108).

Third, there is a need for more systematic empirical studies to examine the conceptual claims of the resource-based scholars. Such studies, although growing in number (cf. Henderson & Cockburn, 1994; McGrath et al., 1995; Montgomery & Wernerfelt, 1988; Robins & Wiersema, 1995), remain too rare, perhaps because of the difficulties of pinning down the predictions of the resource-based view and even of operationally defining the notion of resources (Black & Boal, 1994; Fiol, 1991; Miller, 1996; Peteraf, 1993).

This research begins to address each of these tasks. First, we derive a predictive classification that distinguishes between property-based and knowledge-based resources. Second, we argue that the performance implications each of these resources will differ in predictable as opposed to uncertain environments. Third, in order to test these notions, we undertook a longitudinal study of the seven major Hollywood film studios during two very different eras: the first, one of great stability and predictability, and the second, one of much upheaval, change, and uncertainty.

THE CONCEPTUAL FRAMEWORK

Categorizing Resources

Several researchers have attempted to derive resource categorization schemes. Barney (1991) suggested that resources could be grouped into physical, human, and capital categories. Grant (1991) added to these financial, technological, and reputational resources. Although very useful for the purposes for which they were designed, these categorizations bear no direct relationship to Barney's (1991) initial criteria for utility, namely, value, rarity, difficulty of imitation, and unavailability of substitutes. In this article we revisit a pivotal one of these criteria—barriers to imitability—to develop our own typology. Imitability may be an important predictor of performance as, indeed, it is a central argument of the resource-based view that a firm can obtain unusual returns only when other firms are unable to imitate its resources (Barney, 1991; Lippman & Rumelt, 1982). Otherwise these resources would be less rare or valuable, and substitutability would become irrelevant.

Property-Based Versus Knowledge-Based Resources

There appear to be two fundamentally different bases of nonimitability (Amit & Schoemaker, 1993; Hall, 1992, 1993; Lippman & Rumelt, 1982). Some resources cannot be imitated because they are protected by property rights, such as contracts, deeds of ownership, or patents. Other resources are protected by knowledge barriers—by the fact that competitors do not know how to imitate a firm's processes or skills.

Property-based resources. Property rights control "appropriable" resources: those that tie up a specific and well-defined asset (Barney, 1991). When a company has exclusive ownership of a valuable resource that cannot be legally imitated by rivals, it controls that resource. It can thereby obtain superior returns until the market changes to devalue the resource. Any rival wishing to obtain the resource will have to pay the discounted future value

of its expected economic returns. Examples of property-based resources are enforceable long-term contracts that monopolize scarce factors of production, embody exclusive rights to a valuable technology, or tie up channels of distribution. Property-based resources apply to a specific product or process. And many such resources buffer an organization from competition by creating and protecting assets that are not available to rivals—at least not under equally favorable terms (Black & Boal, 1994: 134). Typically, it is only the fortunate or insightful firms that are able to gain control over valuable property-based resources before their full value is publicly known.

Most competitors will be aware of the value of a rival's property-based resources, and they may even have the knowledge to duplicate these resources. But they either lack the legal right or the historical endowment to imitate successfully. Indeed, it might be argued that in order for property-based resources to generate unusual economic rents, they require protection from exclusionary legal contracts, trade restrictions, or first-mover preemption (Conner, 1991; Grant, 1991).

Knowledge-based resources. Many valuable resources are protected from imitation not by property rights but by knowledge barriers. They cannot be imitated by competitors because they are subtle and hard to understand—because they involve talents that are elusive and whose connection with results is difficult to discern (Lippman & Rumelt, 1982). Knowledge-based resources often take the form of particular skills: technical, creative, and collaborative. For example, some firms have the technical and creative expertise to develop competitive products and market them successfully. Others may have the collaborative or integrative skills that help experts to work and learn together very effectively (Fiol, 1991; Hall, 1993; Itami, 1987; Lado & Wilson, 1994).

Knowledge-based resources allow organizations to succeed not by market control or by precluding competition, but by giving firms the skills to adapt their products to market needs and to deal with competitive challenges. Economic rents accrue to such skills in part because rivals are ignorant of why a firm is so successful. It is often hard to know, for example, what goes into a rival's creativity or teamwork that makes it so effective. Such resources may have what Lippman and Rumelt (1982) called "uncertain imitability": they are protected from imitation not by legal or financial barriers, but by knowledge barriers. The protection of knowledge barriers is not perfect—it may be possible for competitors to develop similar knowledge and talent. But this normally takes time, and by then, a firm may have gone on to develop its skills further and to learn to use them in different ways (Lado & Wilson, 1994).

Contrasts. The respective advantages of property-based and knowledge-based resources are quite different. Property rights allow a firm to *control* the resources it needs to gain a competitive edge. They may, for example, tie up advantageous sources of supply, keeping them out of competitors' hands. Such control of a specific asset, in effect, is the only source of value for property-based resources. Knowledge-based resources typically are better

designed to respond and *adapt* to the challenges facing an organization. Creative skills, for instance, can be used to interpret customer desires and respond to emerging market trends. Of course, property- and knowledge-based resources are not always independent, as the latter may sometimes be used to develop or procure the former.

A key theme of this article is that the benefits of property-based resources are quite specific and fixed and thus, the resources are appropriate mostly for the environment for which they were developed. For example, a process patent ceases to have value when it has been superseded by a new process; a prized location becomes useless when customers move away. In short, a particular property right stops being valuable when the market no longer values the property. Thus, when the environment changes, property-based resources may lose their advantage. This is especially true if the environment alters in ways that could not have been predicted when the property was developed or acquired or when the fixed contract was made (Geroski & Vlassopoulos, 1991). Thus, an uncertain environment—one that is changing and unpredictable—is the enemy of property-based resources.

Knowledge-based resources, on the other hand, often tend to be less specific and more flexible. For example, a creative design team can invent products to meet an assortment of market needs. Such resources can help a firm respond to a larger number of contingencies (Lado & Wilson, 1994). Many knowledge-based resources are in fact *designed* to cope with environmental change. Unfortunately, these resources are not protected by law from imitation, and many are unduly expensive in predictable settings, where more routine but far cheaper response mechanisms can be equally effective. Also, in placid environments, a firm's knowledge may evolve so slowly as to be subject to imitation by rivals. In short, property-based resources will be of the greatest utility in stable or predictable environments, whereas knowledge-based resources will be most useful in *uncertain*, that is, changing and unpredictable, environments.

HYPOTHESES

In order to establish the robustness of our distinction between property-based and knowledge-based resources, we will examine two varieties of each category: discrete resources and bundled, or *systemic*, resources. Discrete resources stand alone and have value more or less independent of their organizational contexts. Exclusive contracts or technical skills are examples of such resources. Systemic resources, on the other hand, have value because their components are part of a network or system. Outlets in an integrated distribution network or skills within a well-coordinated team, for instance, are especially valuable within the context of that system (Amit & Schoemaker, 1993). Stores in a retail chain may have extra value precisely because they benefit from a national brand name and economies of standardization, promotion, and administration. Scientists may be especially productive because of the multidisciplinary synergies and team skills they develop with their co-workers within the context of their organizations. Brumagin (1994) contrasted

discrete and systemic resources, calling them respectively elementary and higher-level resources, and Black and Boal (1994) referred to traits versus configurations.

Discrete Property-Based Resources

Discrete property-based resources may take the form of ownership rights or legal agreements that give an organization control over scarce and valuable inputs, facilities, locations, or patents. Some resources, for example, take the form of leases or contracts that give companies exclusive access to especially valuable materials or to inputs of exceptionally low cost. Such resources are protected by rule of law. And typically, the utility of any exclusive right or contract will be a function of the ease and costs of its enforcement as well as of its duration (Conner, 1991: 138).

Of course, not all firms can obtain such lucrative resources. The fortunate ones may be those that were first to discover value in a resource or gain access to it, or that once had the power to negotiate favorable long-term agreements (Lieberman & Montgomery, 1988). As most discrete resources are independent of one another, a firm stands to gain by amassing as many of these as it can, subject of course to their marginal costs and benefits. For example, some companies tie up so many sources of supply that their rivals must settle for inferior substitutes.

Because discrete property-based resources are primarily designed to provide an organization with a high degree of control, they are likely to be of most value in stable or predictable settings where the objects of control maintain their relevance. In such environments it is simpler to estimate the life expectancy and thus the value of most properties, claims, and contracts. It is also easiest there to plan for additional resource acquisition. Predictability ensures that property-based resources will continue to buffer a firm from its competition for quite some time (Wernerfelt & Karnani, 1987).

Where the environment is changing unpredictably, however, property-based resources are in greater danger of obsolescence. A changing group of competitors may devise new products or processes that nullify existing resource advantages. Customer tastes that alter rapidly may have the same effect. All such changes may be very difficult to foresee at the time of contracting. Exclusive sources of supply, for example, may lose their value when they are replaced by more up-to-date substitutes. Long-term leases on retailing space may be more of a liability than an asset when the targeted customers shift to another type of store or location (Geroski & Vlassopoulos, 1991). Similarly, discrete resources that rely on contracts supported by laws and statutes are in danger of obsolescence the moment these laws change.

Hypothesis 1: Discrete property-based resources will produce superior financial performance in predictable environments but will not do so in uncertain environments.

Systemic Property-Based Resources

Some property-based resources are in the form of systems and their interwoven components; these typically include physical facilities or equip-

ment. By themselves, most concrete facilities are easily imitable: thus, much of their value relies on their role within and their links to an integrated system whose synergy is hard to duplicate (Barney, 1991; Black & Boal, 1994). This is true of some integrated supply, manufacturing, and distribution systems. The units of a distribution network, for example, may be valuable because of their connection with a steady source of supply or with economies of administration and promotion engendered by a well-respected parent company (Barney, 1991; Brumagin, 1994: 94).¹

In the case of systemic resources, managers do not aim to tie up more and more individual assets, but to enhance the range and comprehensiveness of a pre-existing system. Resources are added not to substitute for existing assets but rather, to strengthen a system or competence that is already in place. For example, one might acquire more distributors or outlets to bolster a distribution system (Lado, Boyd, & Wright, 1992: 86–87). The more elaborate the system, the more market penetration it can provide, the more economically it can allocate marketing, administration, and even operating expenses, and the more it can make use of an established brand image or reputation.

Like discrete property-based resources, systemic resources will be more useful in predictable than in uncertain competitive environments. When an environment is predictable, it is easier to appraise the value of systems and to augment them in an orderly way with the aim of increasing the scope of market control. Predictability also allows a firm to determine the steps that it needs to take to fortify its system. Indeed, it is only when the environment is predictable and the existing system is secure that it makes sense for a firm to develop that system.

When the environment is changing unpredictably, however, managers may be reluctant to build onto a system whose longevity is difficult to estimate or that is at risk of becoming obsolete. For example, if distribution technology changes unpredictably, one cannot build onto existing networks. And in an uncertain environment in which clients' demands are ever-changing and hard to anticipate, most property-based systems are threatened with obsolescence (Wernerfelt & Karnani, 1987). Here the useful life of systemic resources may be short and hard to predict, and a firm may find itself controlling assets that generate little revenue (Geroski & Vlassopoulos, 1991).

Hypothesis 2: Systemic property-based resources will produce superior financial performance in predictable environments but will not do so in uncertain environments.

¹ Of course, most fixed resources are eminently imitable. Superior mechanical equipment, for example, can usually be copied, as can most processes that are well understood (Nelson & Winter, 1982). Reed and DeFillippi claimed that "a competitor can simply observe site-embodied performance effects and, through technological deduction, can deduce the same for physical assets" (1990: 93). Competitors may then gain access to the personnel or capital needed to develop or buy the desired asset (Conner, 1991). Such imitable fixed resources are not the focus of resource-based theory and thus are beyond the scope of our study.

Discrete Knowledge-Based Resources

To parallel our analysis of property-based resources, we examine both discrete and systemic knowledge-based resources (Black & Boal, 1994; Brumagin, 1994). Discrete knowledge-based resources may take the form of specific technical, functional, and creative skills (Itami, 1987; Winter, 1987). Such skills may be valuable because they are subject to uncertain imitability (Lippman & Rumelt, 1982). It is often hard to discern just what it is about these skills that generates economic returns or customer loyalty. Therefore, competitors do not know what to buy or imitate. This advantage is protected precisely because it is in some way ambiguous and mysterious, even to those who possess it (Lado & Wilson, 1994; Reed & DeFillippi, 1990). As with discrete property-based resources, firms can benefit from simultaneously developing as many of these knowledge resources as possible. For example, firms can at the same time pursue expertise in design, production, and marketing.

Although unforeseeable changes in markets may render many property-based resources obsolete, knowledge-based resources such as unusual creative and technical skills may remain viable under varying conditions. Indeed, they may actually help a firm adapt its offerings to a changing environment (Wernerfelt & Karnani, 1987). Some creative skills are also quite flexible as they apply to different outputs and environments. And this makes them especially useful in a changing, uncertain setting. For example, where the environment is particularly competitive and rivals are introducing many new offerings, the skills of experts who can adapt and create better products will be especially valuable.²

In a stable or predictable environment, firms may also benefit from discrete skills. But these afford less effective, less efficient, and less secure advantages than do discrete property-based resources. Where a firm can enforce its legal property rights, it possesses almost perfect protection against imitation. This is not true of the protection given by knowledge, which can be lost, especially in stable settings in which knowledge and its application evolve more slowly and are thus easier to copy. Moreover, the high costs of retaining very talented employees may not produce much net benefit in stable contexts that do not demand the full exploitation of their unusual abilities. Predictable settings do not typically call for as deep or extensive a set of skills for product or process innovation and adaptation as do uncertain and changing environments (Miller, 1988; Miller & Friesen, 1984).

Hypothesis 3: Discrete knowledge-based resources will produce superior financial performance in uncertain environments but will not do so in predictable environments.

² A changing environment may itself confer uncertain imitability on some flexible resources. In uncertain settings, the situations facing each firm are constantly varying, as are the organizational processes used to compete. It would be difficult, then, for firms to imitate the superior talents of a competitor simply because those talents are forever being manifested in different ways.

Systemic Knowledge-Based Resources

Systemic knowledge-based resources may take the form of integrative or coordinative skills required for multidisciplinary teamwork (Fiol, 1991; Itami, 1987). Some organizations not only have a depth of technical, functional, and creative expertise but are also adept at integrating and coordinating that expertise. They invest in team-building and collaborative efforts that promote adaptation and flexibility. Indeed, it is not just skills in any one domain, but rather, the way skills from several domains complement one another in a team, that gives many firms their competitive advantage (Hall, 1993; Itami, 1987; Teece, Pisano, & Shuen, 1990; Winter, 1987).

Collaborative skills are most subject to uncertain imitability (Hall, 1993; Peteraf, 1993: 183). According to Reed and DeFillippi, "ambiguity may be derived from the complexity of skills and/or resource interactions within competencies and from interaction between competencies" (1990: 93). There is much subtlety in effective teamwork. The systemic nature of team and coordinative skills makes them especially firm-specific—more valuable to a firm than to its competitors (Dierickx & Cool, 1989: 1505). Team talents, therefore, are difficult for rivals to steal as they rely on the particular infrastructure, history, and collective experience of a specific organization.

Collaborative skills typically do not develop through programmed or routine activity. Instead, they require nurturing from a history of challenging product development projects. These long-term projects force specialists from different parts of an organization to work together intensively on a complex set of problems. And such interaction broadens both the technical and social knowledge of organizational actors and promotes ever more effective collaboration (Itami, 1987; Schmookler, 1966).

The above arguments suggest that team building is apt to be more necessary, more rewarding, and perhaps even more likely in uncertain than in predictable environments (Hall, 1993; Porter, 1985). Collaborative talents are robust—they apply to a wide variety of situations and products. In contrast with fixed routines, teamwork enables companies to handle complex and changing contingencies (Thompson, 1967). Moreover, "unlike physical assets, competencies do not deteriorate as they are applied and shared. . . . They grow" (Prahalad & Hamel, 1990: 82). Collaborative skills not only remain useful under changing environments, they also help firms to adapt and develop new products for evolving markets (Lawrence & Lorsch, 1967; Thompson, 1967). Indeed, the flexibility born of multifunctional collaboration will help firms to respond quickly to market changes and challenges (Mahoney & Pandian, 1992; Wernerfelt & Karnani, 1987).

In stable environments, on the other hand, the returns to collaborative and adaptive skills may be small. Where tasks are unvarying, coordination can be routinized very efficiently, and thus coordinative or team skills will be less important (Thompson, 1967). Moreover, when customer tastes and rivals' strategies are stable, there is little need to constantly redesign or adapt products. In such contexts, the modest benefits of intensive collaboration may not justify the costs.

Hypothesis 4: Systemic knowledge-based resources will produce superior financial performance in uncertain environments but will not do so in predictable environments.

Table 1 summarizes our analytical framework.

RESEARCH METHODOLOGY

Sample and Historical Eras

Our sample consisted of the seven major Hollywood film studios from 1936 through 1965. These studios included MGM, Twentieth Century-Fox, Warner Brothers, Paramount, United Artists, Universal, and Columbia. Although United had few production facilities, it helped finance and distribute movies by independent producers, some of whom had part ownership in the company. The only other potential major, RKO, was deleted from the sample because it terminated operations in 1956, a full nine years before the end of our study. Prior to that, RKO had gone through frequent reorganizations and changes in form and management (Lasky, 1989).

Our study encompasses two rather different periods: one of stability, lasting from about 1936 to 1950, and another of challenging uncertainty, occurring between 1951 and 1965. Although uncertainty was not the only difference between the two eras, respected industry scholars such as Balio (1985), Gomery (1991), and Mast (1992) have attested that it was an important one. By conducting separate analyses for the two eras, we hoped to show the differential utility of property- and knowledge-based resources in stable and uncertain contexts.

TABLE 1
A Contingency Resource-Based Framework

Resource Type and Example	Value from	Created or Protected by	Suitable Environment
Property-based			
Discrete: Patents and exclusive contracts	Control of factor	Law Preemption Intrinsic scarcity	Stable or predictable
Systemic: Integrated production or distribution systems	Control of an entire system	Property rights First-mover advantages Complementarity of system parts	Stable or predictable
Knowledge-based			
Discrete: Functional and creative skills	Adaptation and renewal	Uncertain imitability Flexibility	Uncertain
Systemic: Coordinative and team skills	Adaptation and renewal	Asset specificity Uncertain imitability Robustness	Uncertain

The period from the early 1930s to the late 1940s is considered to be the Golden Years of the major studios. Before then, there had been growing consolidation in the film industry (Bordwell, Staiger, & Thompson, 1985: 403). But the last significant merger took place between Fox and Twentieth Century in 1935. Around the same time, Paramount reemerged from bankruptcy as a new organization. Thus, by 1936 the industry had matured into the oligopoly that became known as the studio system. And for the next dozen years or so, demand for films remained strong, reflected both by stable patterns of attendance—80 to 90 million admissions per week throughout the entire period—and by gradually increasing box office revenues (Steinberg, 1980). Also, stable customer preferences meant that studios could predict that particular stars, directors, and genres of films would remain popular for a considerable time (Bohn, Stromgren, & Johnson, 1978; Gomery, 1991). Thus, the production process became quite routine as similar crews worked together under the supervision of a single production head or a few key producers (Staiger, 1985: 320).

All of the studios of the day developed their own stables of talent by signing a wide variety of stars to exclusive, long-term contracts. Four of the major studios also owned or leased theaters in significant locations across the country. Collectively, the majors controlled fewer than 3,000 theaters of the 18,000 operating nationwide. These, however, included the preponderance of first-run cinemas in big cities that drew 75 percent of the national box office (Balio, 1985: 255). Cinemas not associated with the major studios were mostly in small towns and showed second-run films. Because many studios controlled their stars and were guaranteed distribution for their films via their theaters, they were able to plan well in advance a steady stream of film offerings (Gomery, 1991; Whitney, 1982). Stable demand brought a very reasonable chance of success, and control over theaters made sure all of a studio's films would have an audience.

The period from the early 1950s to the mid 1960s brought about significant transformations in the industry that greatly enhanced the level of uncertainty (Balio, 1985; Mast, 1992). By 1950, television sets had entered 25 percent of homes, and this penetration had doubled to 50 percent by 1952. As a result, cinema attendance declined significantly from 1949 to 1953 and then stabilized at only about 40 to 50 million admissions per week. Firms began groping to find new ways to attract moviegoers and soon started to differentiate their films from television programs by making grander and more lavish productions (Mast, 1992: 275; Stuart, 1982: 295). They experimented with new techniques involving color film, wide screens, and stereophonic sound. Thus, the technical and creative skills of studios became ever more important as growing entertainment alternatives made moviegoers more discriminating. Also, cycles of popularity had become much shorter as jaded audiences quickly grew tired of particular genres or stars (Bohn et al., 1978; Gomery, 1991). Box office failures became common as falling demand made studios compete fiercely for increasingly unpredictable audiences.

The concentration on more complex and expensive projects cut down on the number of films produced and made the success of each production more important. In response, some studios began to search for the few key stars, directors, or producers who could reduce the risks of their big budget films (Kindem, 1982: 88). But now they were less apt to hire such people on a permanent basis as the popularity of talent could be rapidly eroded and because talent would be underutilized with the few films made. As a result, the coordinative skills needed to assemble and direct *nonpermanent* cast members in very complex productions became invaluable (Mast, 1992; Staiger, 1985). This was especially true as the complexity and variety of productions increased.

To contribute further to this climate of uncertainty, the studios began to lose control over their distribution outlets and their stars. Although the major studios were first targeted by antitrust proceedings in the late 1930s, the first truly effective steps to reduce their power were only taken in the late 1940s. These culminated in a ruling by the U.S. Justice Department in 1948 that ultimately forced the majors to sell off their theaters by the late 1950s. But by then the movement of the population to the suburbs had already reduced the value of many of the studios' downtown theaters (Mast, 1992: 277). This declining control over distribution increased the burden on the studios to produce only those films that would have the best chance of being distributed—a great challenge in the more discriminating market (Whitney, 1982).

In the face of their reduced output, the studios began gradually to abandon the practice of signing stars to exclusive contracts, and in fact drastically cut back on the number of stars during the late 1950s. These reductions gave studios less control over a key production factor. Moreover, given the more rapidly changing customer tastes, stars tended to have shorter productive lives, while at the same time, stars' independence from studio contracts bid up their value more quickly (Kindem 1982).

To recap, the era from 1936 to 1950 was one of much stability, but 1951 to 1965 witnessed a far more uncertain (that is, changing and unpredictable) environment. We terminated our period of analysis in 1965, as after that conglomerates began to buy up many of the studios. These purchases in large part occurred because so many studios had fallen in value, and some were approaching bankruptcy. Also, by the late 1960s the studio system was replaced by one dominated by independent producers and directors (Bohn et al., 1978).

In order to confirm these differences in uncertainty between the two periods, we assessed year-to-year industry stability in revenues, market shares, and profits: this volatility was reflected by the correlation between a firm's results in year t and its results in year $t - 1$ for each of the eras. For the first era, the interyear correlation coefficients for revenues, market share and profits were .97, .97, and .80; for the second era, the numbers were .78, .70, and .31. Clearly, the first era shows greater stability among these measures than the second period ($p < .10$, $< .05$, and $< .01$, respectively). Another

indicator of industry uncertainty, turnover in studio production heads, was 40 percent higher in the second than in the first era ($p < .01$). In part this was because of more frequent flops at the box office and because of the more pressing need to introduce new kinds of films.

Although industry concentration ratios remained about the same for both periods, the two eras differed greatly in uncertainty. This difference was due to declining demand, which resulted in greater rivalry for audiences, more fickle and rapidly changing customer tastes, increased emphasis on fewer, larger, and more risky film projects, and a loss of control over factor inputs and distribution. These qualitative contrasts seemed to be mirrored by our quantitative indicators. Of course, because industry environments are so multifaceted, our two eras no doubt also vary in aspects other than uncertainty.

Variables

Discrete property-based resources. In the film industry, long-term contracts for stars represented a key discrete property-based resource (Kindem, 1982). Each studio tried to develop its own pool of potential stars from among individuals who were recruited early in their careers at relatively low costs. Even during the peak years of moviegoing, fewer than a hundred contracts controlled stars who accounted for the lion's share of box office revenues. Studios thus competed with each other to obtain exclusive long-term (typically, seven-year) contracts with such stars (Shipman, 1979). Often, stars were signed simply to prevent other studios from being able to benefit from their talents. If rival studios wanted to borrow a star, they would have to pay a substantial price and sometimes even split profits with the studio that held the star's contract. Stars who threatened to break a contract would usually be punished by being given poor roles or by banishment from the industry (Huettig, 1985: 253).

We obtained data on the number of long-term contracts with stars that were held by each studio or its producers for each of the years studied. The sources of these data were two volumes by Shipman (1972, 1979) containing biographical profiles of all the stars who had appeared in any significant films in either leading or supporting roles. These biographies were all coded individually to link the relevant stars to all the major studios for every year of the study. All contracts for stars that ran for four or more years during the period between 1936 and 1965 were included in the data.

Systemic property-based resources. Some might argue that studio plant and equipment represent valuable discrete resources. But resource-based theorists would maintain that these assets are imitable and purchasable and thus cannot confer any true competitive advantage (Conner, 1991). Every one of the major studios either owned or leased production lots, props, sets, and camera equipment (Huettig, 1985). In fact, some of these studios even rented out their facilities and equipment to producers who could not afford to buy them.

Theaters controlled by each studio, in contrast, did represent a systemic property-based resource. Well-situated theaters that were either owned or leased long-term by the studios afforded control over valuable distribution outlets. Indeed, theaters owned by the studios were almost all situated in prime locations: collectively, the studios owned over 70 percent of the theaters located in cities of over 100,000 people (Whitney, 1982: 166). Inferior locations in rural communities were left to the independent cinemas. Also, studios tended each to concentrate their theaters in different cities from one another to reduce direct competition. More important, a network of theaters provided studios with an extensive and compliant showcase for films and denied competitors equal access to films and customers (Conant, 1960). The close integration of a studio and its theaters ensured that a firm's own cinemas were given a steady supply of top-ranking films while independents were left with second-run movies. A network of theaters also gave studios reliable outlets for *all* of the films they produced. In addition, studio-owned theaters benefited from parent support of advertising, promotion, and administration, and economies of operation were effected by allocating costs across a large network of cinemas. Even popcorn purchases were centralized. The result was that theaters controlled by the studios averaged annual revenues that were *15 times* those of the independents (Balio, 1985: 255). Theaters, then, were made more valuable through their integration into a network and their association with studios. Such systemic asset specificity and the control of key locations made theaters an especially hard-to-copy resource (Black & Boal, 1994).

We obtained information on the number of domestic theaters owned or under long-term lease for each studio for each year from figures provided in *Moody's Industrial Manuals*.

Discrete knowledge-based resources. In the film industry, the discrete knowledge-based resources of each studio lie in the creative and technical skills that it has been able to build up. Each studio tried to develop unique abilities in various areas of film production that it could use to differentiate its films from those produced by its competitors (Mast, 1992: 230–231). These diverse skills included expertise in script development, set design, direction, camera work, sound, and editing. Studios created large pools of skilled individuals that they could draw upon to work on the many films that they produced each year. MGM, the largest studio, developed a workforce of 6,000 skilled employees distributed among 27 departments (Balio, 1985: 264).

Many studios tried to develop reputations around their various technical skills in order to attract more talent. The level of these skills is in part reflected by the number of Academy Awards that a studio won each year. The majority of such skills were in creative and technical categories such as screenplay, cinematography, editing, costumes, set design, and sound. Although these awards were given to individuals of exceptional ability, they also reflected a studio's success in recruiting, developing, and supporting talent. We gathered data on the percentage of Academy Awards that were won annually by each studio. The primary source for this data was a complete

listing of Academy Awards published by Michael (1968). It might be argued that Academy Awards also represent an outcome measure of performance; but for the purposes of this study we used awards to infer the existence of talent that might later enhance financial returns.

Systemic knowledge-based resources. Although studios could try to build discrete abilities, they also needed to integrate these by developing coordinative team skills (Balio, 1985). This was especially true in the second era, when studios had to assemble large groups of temporary employees who had little experience working together to collaborate on each complex, big-budget project. Such large, long-term projects with huge casts and crews operating on elaborate sets required studios to learn a great deal about how to get people to work together effectively. Studios with a history of such large projects were most apt to learn the coordinative and integrative skills needed for success (Staiger, 1985: 300–336; Stuart, 1982: 294; Robins, 1993). This process was a prime example of learning by doing.

Team, coordinative, or integrative ability therefore may be reflected, albeit imperfectly, by a studio's former investments in complex, large-scale film projects. Large projects develop coordinative skills because they require the management of many talents and resources from many specialties over long periods of time (Stuart, 1982: 295–296). A history of having worked on such major films promotes new learning about project management; it also creates team synergies that can be used to good effect in subsequent projects (Robins, 1993).

The scale and complexity of past projects is reflected in the last two years' average production costs per film (Huettig, 1985: 306). We obtained this data on film costs and producers' fees from the annual financial statements of each studio. We averaged production costs for the films that had been released by the studio over the previous two years to reflect the recent history of expenditures.

Trends in demand. The annual level of demand is a key index of industry health that can influence performance. Therefore, all of our analyses included a control variable that measured the percentage of household recreational spending devoted to movie attendance. These data were obtained from the U.S. Department of Commerce, Social and Economic Statistics Administration (Steinberg, 1980).

Performance indexes. There are many alternative indexes of economic returns—return on assets, return on sales, operating profits, market share, and even total revenues. For purposes of this study, we decided to look at a variety of financial performance indexes in order to establish the range and robustness of our findings.

We could not use return on asset measures because of differences in the asset reporting and composition of the film companies. Some studios were diversified and did not segregate assets from nonfilm businesses in their financial reports; United Artists did not own any production facilities. We did, however, compute annual return on sales, both with and without theater revenues and profits. We also examined operating profits, but without the

theater operations. We did not measure operating profits with theaters as this would have artificially penalized and rendered noncomparable the studios that did not own any theaters. Finally, we included the domestic market share figures for each of the studios. In every instance, we were concerned only with the revenues and profits from a studio's *film* business.

Data on revenues and profits for each studio were obtained from *Moody's Industrial Manual* and from company financial reports. For studios that owned theaters, separate revenue and profit figures were obtained for the production and distribution of films and for the operation of theaters. Revenues and profits were also adjusted for any television business reported. Annual market share data for each studio were derived from its revenues as a percentage of total box office receipts for the year. This information was obtained from the U.S. Department of Commerce, Social and Economics and Statistics Administration.

Analyses

The data consisted of 30 years of observations across seven studios. Separate analyses were conducted for the predictable (through 1950) and uncertain (1951 onwards) periods. Each of the two periods consisted of 14 years, after one year per era was lost as a result of the lagging and averaging of variables. Given the longitudinal nature of our study, it was necessary to transform our data to avoid any problems of autocorrelation and heteroscedasticity. To do this transformation, we used pooled time series cross-sectional analyses (Kmenta, 1986: 616–625). This procedure first adjusts the data for autocorrelation using the Prais-Winsten (1954) iterative transformation. To establish the adequacy of a first-order autocorrelation adjustment, we inspected the correlograms for the analyses. These declined rapidly at higher lags, confirming both the stationarity of the time series process and the adequacy of a first-order correction. Separate autocorrelation adjustments were done for each firm.

A second transformation of the data was then employed to correct for heteroscedasticity. We divided the dependent and independent variables by the firm-specific error variances obtained from the regressions on the autocorrelation-corrected data. The twice-transformed data could then be pooled and analyzed using ordinary-least-squares regression analysis (cf. Judge et al., 1988: Section 11.5; Sayrs, 1989).

To avoid specification error in the models, all of the analyses incorporated measures of performance in the prior ($t - 1$) period. Because of the inclusion of this lagged dependent variable, we employed Durbin's H test to ensure an absence of bias in the estimates of the residuals (Judge et al., 1988: 401). Plots of residuals were inspected to confirm the absence of patterns due to heteroscedasticity or autocorrelation (Sayrs, 1989). We also ascertained that multicollinearity was not a problem in our analyses using the diagnostics of Belsley, Kuh, and Welsch (1980). Finally, to establish that the results were not overly sensitive to our choice of ending dates, we reanalyzed the data after changing the termination date from 1965 to 1959. The results did not alter.

FINDINGS

Tables 2, 3a, and 3b present the descriptive statistics and correlation matrixes for the two eras. The hypotheses were tested using the autoregressive heteroscedastic models of Tables 4 and 5.

It is worth examining some basic contrasts between the two eras. First, Table 2 shows that consumer spending on films as a percentage of annual entertainment budgets declined from 19.5 percent in the first period to 6.6 percent in the second. Second, profitability was lower in the second than in the first period ($p < .02$). Third, as we indicated before, there are striking differences between the two eras (compare Tables 4 and 5) in the interyear relationships of all the performance variables. The earlier, more predictable era shows strong relationships between all performance measures and their lagged values, thereby suggesting stability in the competitive environment. By contrast, the second, more uncertain era produced much lower interyear correlations for the performance variables, substantiating the notion that the competitive environment had become more uncertain. Thus, these results again appear to bear out our characterization of the two periods as, respectively, stable and uncertain.

Property-Based Resources

Hypothesis 1 suggested that discrete property-based resources such as long-term contracts for movie stars would help performance in predictable settings but not in uncertain settings. This hypothesis was supported for all four of the performance measures: return on sales with and without theaters, profits, and market share. Tables 4 and 5 indicate that long-term contracts for stars contributed broadly to performance in the early, predictable era, but not in the uncertain era. These results support the utility of long-term

TABLE 2
Descriptive Statistics

Variables	1936-50		1951-65	
	Mean	s.d.	Mean	s.d.
Financial performance				
Return on sales without theaters	0.11	0.10	0.07	0.09
Return on sales with theaters	0.12	0.09	0.07	0.09
Profits from films	7.08	7.40	5.34	8.22
Domestic market share	11.35	4.68	12.55	3.04
Domestic film revenues	34.60	15.66	39.78	10.81
Resources				
Stars under long-term contract	12.49	8.91	4.79	5.94
Theaters owned or leased	208	216	14	55
Academy Awards won	12.61	13.21	13.03	14.36
Production costs per film	2,111	1,289	5,074	2,117
Control variables				
Consumer spending on films	19.53	3.67	6.61	2.41

TABLE 3a
Pearson Correlations, Early Era: 1936-50

Variables	1	2	3	4	5	6	7	8	9
1. ROS without theaters									
2. ROS with theaters	.94								
3. Profits	.93	.86							
4. Revenues	.49	.55	.67						
5. Market share	.37	.39	.50	.76					
6. Stars	.34	.30	.53	.72	.85				
7. Theaters	.29	.45	.38	.56	.54	.29			
8. Academy Awards	.12	.09	.25	.36	.44	.40	.21		
9. Costs per film	-.07	.02	.31	.74	.34	.44	.41	.22	
10. Consumer spending	.50	.42	.40	-.10	.02	.09	.02	.05	-.38

TABLE 3b
Pearson Correlations, Late Era: 1951-65

Variables	1	2	3	4	5	6	7	8	9
1. ROS without theaters									
2. ROS with theaters	.99								
3. Profits	.94	.94							
4. Revenues	.18	.17	.33						
5. Market share	.08	.08	.22	.87					
6. Stars	.02	.00	.06	.59	.40				
7. Theaters	.09	.03	.08	.27	.17	.55			
8. Academy Awards	.05	.04	.10	.25	.29	.10	.11		
9. Costs per film	.07	.07	.03	.09	.31	-.25	-.06	.06	
10. Consumer spending	.18	.16	.20	.37	-.05	.50	.28	.02	-.64

contracts during an era when studios aggressively managed stars' careers and thoroughly exploited their popularity by casting them in two or three films per year. By contrast, during the uncertain era, long-term contracts with stars became more risky in part because of the increasingly fickle tastes of moviegoers.

As we noted, by the late 1950s, studios began to abandon the system of long-term contracts. Because of this change, our analyses of the second, uncertain era may have been biased—but mainly in the years after 1958, when the number of stars under contract had begun to decline precipitously. To assess this bias, we reran the analyses whose results are shown in Table 5 using only the years 1951-58. The earlier results were replicated: stars did not relate to any index of performance in the uncertain era.

According to Hypothesis 2, systemic property-based resources, such as control over theaters, and thus over film distribution, would also contribute to financial performance—again in predictable but not in uncertain contexts. Tables 4 and 5 indicate that this hypothesis was borne out for three of the four performance measures: the two return on sales indexes and

TABLE 4
Autoregressive-Heteroscedastic Models, Early Era: 1936-50

Resources	Return on Sales		Profits	Market Share
	Without Theaters	With Theaters		
Property-based				
Stars under long-term contract	.18**	.12*	.18*	.18***
Theaters	.11 [†]	.18**	.06	.07*
Knowledge-based				
Academy Awards	-.01	-.02	.02	.03
History of per-film production costs	-.12 [†]	-.11 [†]	-.00	-.07 [†]
Controls				
Lagged dependent variable	.57***	.69***	.57***	.80***
Movies as percentage of entertainment budget	.16*	.11*	.14**	-.07**
Buse R^2	.60	.73	.62	.96
F	23.1	40.2	24.3	424.6
p	.000	.000	.000	.000

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

TABLE 5
Autoregressive-Heteroscedastic Models, Late Era: 1951-65

Resources	Return on Sales		Profits	Market Share
	Without Theatres	With Theatres		
Property-based				
Stars under long-term contract	-.04	-.01	-.02	.09
Theaters	.05	-.02	.04	-.04
Knowledge-based				
Academy Awards	.06*	.06*	.10**	.23***
History of per-film production costs	.11*	.12*	.27***	.07
Controls				
Lagged dependent variable	.31**	.29**	.17**	.69***
Movies as percentage of entertainment budget	.16*	.16*	.32***	-.01
Buse R^2	.23	.22	.39	.75
F	4.6	4.2	9.8	46.0
p	.05	.05	.002	.000

* $p < .05$

** $p < .01$

*** $p < .001$

market share. Operating profits did not relate to theater ownership, however, perhaps because of the lower rental charges that studios levied against their theaters (Conant, 1960: 134–135; Huettig, 1985: 296–297). These results confirm the value of theaters during the earlier, more predictable era when the theaters served as outlets for a studio's own movies. During the second era, as demand became more selective and erratic, theaters became less valuable.

In examining results for the later, uncertain era, it is important to remember that studios divested themselves of theaters during this period because of pressure from the U.S. Department of Justice (the number of theaters controlled by the majors went from 2,871 in 1936, to 3,084 in 1949, to 1,156 in 1953). By 1959, all studios had disposed of their theaters. To establish whether the impact of theater control on performance was higher before that date, we dropped the years 1959 to 1965 from our analyses of the second era. As before, and as predicted, all results remained nonsignificant. It is encouraging that our findings remained stable even after we changed the termination date of the analyses from 1965 to 1959. Still, given the sharp reduction in the number of theaters controlled during the uncertain second era, these last results must be interpreted with caution.

Knowledge-Based Resources

Hypothesis 3 states that discrete knowledge-based resources such as technical and creative skills—here reflected by the Academy Awards a studio earned—would contribute to financial performance in uncertain environments but not in predictable environments. This hypothesis was borne out for all four indexes of performance: that is, all predicted relationships attained significance in the uncertain era, none in the predictable era.

It seems that during the predictable era, when audiences were hungry for film entertainment and less discriminating in their viewing preferences, excellent or distinctive productions contributed little to economic returns. However, with the advent of television, movies stood a better chance of success if they had something special to offer: excellent acting or directing, good screenplay, and captivating cinematography and musical scores (Mast, 1992: 288–289).

Hypothesis 4 concerns systemic knowledge-based resources such as the coordinative and collaborative skills produced by a history of big, long, and complex film projects. These skills were expected to contribute to financial performance in uncertain environments but not in predictable ones. Our surrogate measure for a history of such collaborative projects, average production budgets per film for the prior two years, correlated with all of our performance measures, save market share, during the later, uncertain era ($p < .05$). The results were strikingly different for the earlier, predictable period when returns on sales bore significantly *negative* relationships with production budgets. High production costs appeared to represent an expendi-

ture during this early period that was simply not justified by the market response.

In the early period, the majority of films were produced quickly and cheaply in order to meet a constant and relatively indiscriminating demand. Smaller projects did not demand great integrative skills; centralized film-making made coordination easy; and mega-films did not justify their higher expenses in an easy-to-please market. In the later, more uncertain period, by contrast, films required bigger investments in both development and execution in order to stand out and do well. These distinctive projects required elaborate and expensive coordinative efforts among a wide range of specialists, many of whom were hired by the studios only for the duration of the project. Consequently, coordinative skills that were developed through recent experience with bigger film projects tended to yield superior returns.

DISCUSSION AND CONCLUSION

For the past two decades, the field of management strategy has been much influenced by concepts and insights from the literature on economics and industrial organization (Rumelt, Schendel, & Teece, 1991). Indeed, the resource-based view is itself firmly rooted in economic notions of market power and competition (Conner, 1991). Unfortunately, there remains much to be done to test empirically the relevance of some economic notions for firm performance, and this is true as well of the resource-based view. Although there are long lists of candidates for valuable resources, there have been very few efforts to establish systematically if, when, and how these resources influence financial performance. Perhaps more important, the literature contains many generalizations about the merits of some resources, conjectures that often fail to consider the *contexts* within which these resources might be of value to an organization. Thus, after years of interesting conceptual work, we are still at an early stage in knowing what constitutes a valuable resource, why, and when (Amit & Schoemaker, 1993).

This article endeavors to make some progress in those directions. It shows that both property- and knowledge-based resources that are hard to buy or imitate contributed to performance: to returns on sales, operating profits, and market share. However, the environmental context was all-important in conditioning these relationships. Periods of stability and predictability favored firms with property-based resources but did not reward those with knowledge-based resources. Precisely the opposite was true for periods of uncertainty, even though the sample of firms was identical. It follows, then, that whether or not an asset can be considered a resource will depend as much on the context enveloping an organization as on the properties of the asset itself. It is misleading to attempt to define resources independent of the tasks they are to serve and the environment within which they must function (cf. Barney, 1991).

This study also shows that property-based resources may quickly lose their value when an industry changes (Barney, 1986; Geroski & Vlassopoulos, 1991). Static resources that are used for control usually demand institutional or legal protection that is beyond the influence of a firm. Once this protection lapses, or as soon as the environment changes to devalue the resources, all competitive advantage is lost. This liability may not accrue to the same degree to the more adaptable knowledge-based resources.

An auxiliary object of this research was to show how one might operationally define and measure various potentially valuable resources. It is, it seems, possible to identify key resources for a particular industry and then derive quantitative indicators that reflect, with greater or lesser accuracy, a firm's wealth in such resources. Doing so is not a simple task, however. Considerable ingenuity no doubt will be required of subsequent researchers if they are to avoid trivial or tautological indexes, especially in assessing elusive notions such as skills and learning.

This study, however, is just a beginning. And as such, it has its share of shortcomings. First, it is limited to a single industry: research in other industries will be needed to confirm the generality of its conclusions. Second, we have focused on only four kinds of resources, albeit ones that have been shown to be most relevant to the film industry. Further research will be needed to examine the usefulness of this framework with other types of resources. Third, there may have been environmental differences between our two historical eras that have little to do with unpredictability or uncertainty yet contribute to our findings on the differential superiority of our categories of resources—in short, there may be alternative explanations for our results. A final limitation is that in historical studies such as this, much use has to be made of secondary sources and archival records. Use of such sources leads to problems of data availability. In this analysis, for example, historical reporting of assets was too aggregated to allow us to accurately measure return on assets.

We hope that these shortcomings will spur others to initiate more refined research into the resource-based view. And we are indeed pleased that many of the notions of that view do seem to be important to the way organizations must craft their strategies to succeed in different environments. Further research might investigate whether tailoring resources to industry uncertainty contributes to superior performance. Do knowledge-based resources have an edge in turbulent industries such as software, semiconductors, and biotechnology? Are property-based resources more useful in stable sectors such as mining, utilities, and industrial chemicals? And can mergers of companies with complementarities among both kinds of resources—media and film production companies, for instance—create especially powerful combinations?

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PROCEDURAL JUSTICE IN ENTREPRENEUR- INVESTOR RELATIONS

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This research used a procedural justice perspective to examine the impact of entrepreneurs' management of information flows in the form of feedback and influence on entrepreneur-investor relations. We conducted both an experiment with master's-level business students and a field survey of venture capitalists regarding their relations with the CEOs of their portfolio companies. The findings revealed the importance of timely feedback in promoting positive relations between investor and entrepreneur. Together, the studies provide strong evidence for the usefulness of procedural justice theory as a framework for understanding the management of interorganizational relations involving new ventures.

Among the most difficult challenges facing entrepreneurs seeking to build a high-potential venture is that of financing its ongoing needs (Bygrave & Timmons, 1992). Because such ventures require significant infusions of capital whose timing cannot easily be anticipated in advance, entrepreneurs seek alliances with reliable sources of outside funding. Larson (1992) showed that the social aspects of these alliances are critical to their coordination and maintenance. Specifically, she showed that when the economic interests of entrepreneurs and outsiders are governed through positive social interaction, such partnerships endure. CEOs of new firms enhance the probability of success when they establish the kind of relationship described by Larson. Important relationships inevitably develop between entrepreneurs and outside investors (Bruno & Tyebjee, 1985), but research on how entrepreneurs sustain or manage their relationships with investors is scant (Sapienza, 1989). At issue for entrepreneurs is how to foster the attitudes and behaviors necessary for sustaining an effective relationship.

Entrepreneurial CEOs must secure both investors' trust and their support for venture strategies. Engendering the trust of an influential investor will enhance an entrepreneur's reputation and help establish other exchange relationships, such as those with suppliers and buyers (MacMillan, Kulow, & Khoylian, 1989). A supportive investor can also help secure timely funding

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from others and intercede to quash dissent from board members doubtful of the strategies preferred by the entrepreneur. Although investors' trust and decision support are important, entrepreneurs may be most affected by how aggressively the investors monitor ventures and how willing they are to supply them with additional funds. Van de Ven and Walker (1984) pointed out that monitoring can lead to conflict in interorganizational relations. If monitoring involves data production, analysis, and presentation, entrepreneurs may find it costly and oppressive. These activities draw entrepreneurs from their productive activities and slow decision making. Finally, if investors decide not to reinvest in the ventures, entrepreneurs may be in the unenviable position of convincing new investors that the ventures are worthwhile, despite the fact that their current backers will no longer support them.

Previous studies of interfirm alliances have suggested that interactions help form attitudes and norms in entrepreneur-investor pairs (Larson, 1992; Ring & Van de Ven, 1992; Van de Ven & Walker, 1984). Particularly important will be how much feedback entrepreneurs should provide investors and how much investor involvement they ought to encourage (Sapienza & Gupta, 1994). Entrepreneurs may see good reasons to provide timely information and encourage involvement from investors. First, timely feedback may enhance investors' ability to provide useful strategic advice (Gorman & Sahlman, 1989; MacMillan et al., 1989). Further, timely communication helps create a spirit of partnership and enhances entrepreneurs' chances of gaining support for strategic initiatives (Kim & Mauborgne, 1993; Ring & Van de Ven, 1994). Finally, when entrepreneurs keep investors apprised of developing needs, they increase the chances that additional infusions of capital will be available when needed.

Although provision of timely feedback appears to offer benefits, anecdotal accounts from venture capitalists and entrepreneurs indicate that entrepreneurs provide much less feedback than investors desire, often to the point of creating significant conflict (e.g., Rock, 1987; Sapienza, 1989). Good reasons, personal and professional, may be behind the entrepreneurs' reluctance to share information. Many entrepreneurs start their businesses because they seek autonomy and decision-making control (Dubini, 1989); to constantly report, consult, or share decision-making authority may defeat their own purpose. Sharing information also diminishes a CEO's power over a board because, as agency theory suggests, it diminishes the CEO's informational advantages over outsiders (Jensen & Meckling, 1976). Further, because most investment agreements contain provisions for the removal of the CEO by the board of directors if certain performance standards are not met (Gladstone, 1988), entrepreneurial CEOs will have an incentive to delay or obscure performance results when things are going poorly. Fully revealing even excellent performance may also undermine the entrepreneur's interests, for it may increase the price investors can extract if they sell their shares back to the venture. Finally, feedback is time-

consuming and may undermine investors' confidence in the leadership of the venture.

The above discussion suggests that entrepreneurs face a serious dilemma, a dilemma whose resolution will have a significant impact on venture outcomes. On the one hand, withholding information may undermine trust and support, induce excessive monitoring, and hamper timely access to needed funds. On the other hand, providing feedback is costly, sacrifices entrepreneurs' informational leverage, and may shake investors' confidence without significantly improving decisions. The fear of loss of power or dismissal is no doubt a powerful force for entrepreneurs. But will their position be enhanced or harmed by freely sharing information? We propose in this investigation that procedural justice theory can provide insights into how entrepreneurs might effectively manage investor relations through their handling of the decision-making process. Originally developed as an extension of equity theory (Thibaut & Walker, 1975), procedural justice theory has proven to be a powerful framework for understanding the impact of decision procedures on intrafirm relations (Kim & Mauborgne, 1991, 1993; Korsgaard, Schweiger, & Sapienza, 1995). The cited studies have shown that how decision procedures are conducted shapes the attitudes and actions of those engaged in the process. Most studies employing procedural justice theory have been conducted in the context of intrafirm, superior-subordinate relations (Sheppard, Lewicki, & Minton, 1992). If applicable across organizational boundaries and in nonhierarchical relations, this perspective can provide guidance as to how entrepreneurs should manage their relations with investors.

This article reports the results of two studies, a laboratory experiment and a field study, designed to examine the impact of entrepreneurs' decision-making behavior on outside investors. Specifically, we used procedural justice theory to focus on how the entrepreneurs' provision of feedback and responses to the investors' attempts at influence affect the latter's impressions of the justice of the decision procedures, and consequently, the extent to which investors (1) trust entrepreneurial CEOs, (2) are committed to their decisions, (3) closely monitor their actions, and (4) are willing to reinvest in the ventures. The use of both studies was critical to adequately test the theory and understand the phenomenon. The causal ordering among such attitudes and behaviors as procedural justice, trust, commitment, and monitoring is difficult to disentangle. Therefore, we conducted a lab experiment that allowed us to introduce the variables in the temporal order suggested by procedural justice theory. However, entrepreneur-investor relations involve millions of dollars and, at times, highly emotional and volatile relations. Such factors may not be fully captured in a lab setting. Because we deemed it necessary to study the phenomenon in the field under realistic, but not controllable, conditions, we also conducted a large-sample survey of venture capitalists on the effects of entrepreneurs' decision-making practices. In summary, our aim was to shed light both on entrepreneur-investor relations and on the generalizability of the procedural justice framework.

PROCEDURAL JUSTICE AND ENTREPRENEUR-INVESTOR RELATIONS

Procedural justice theory is concerned with individuals' reactions to decisions in which they are personally invested but that they cannot directly or fully control. This theory evolved from equity theory (Adams, 1965), which focuses on the fair distribution of resources in exchange relationships. In contrast to equity theory, which emphasizes the *outcome* of decisions, procedural justice theory examines the impact of the *process* of decision making on the quality of exchange relationships (Lind & Tyler, 1988).¹ The theory suggests that individuals value just procedures because they provide a means of indirect control over a decision when direct control is not possible (Thibaut & Walker, 1975). Even when a particular decision has adverse outcomes for an individual, just procedures ensure the individual that, over time, he or she will receive what is due from the exchange relationship. In essence, just procedures allow individuals to feel that their interests are being protected over the long run (Lind & Tyler, 1988).

Research in this area has demonstrated that procedural justice is an important determinant of attitudes and behavior, particularly when the outcome of a decision is unfavorable (Lind & Tyler, 1988). Indeed, procedural justice is positively related to trust in a decision maker (Folger & Konovsky, 1989; Korsgaard et al., 1995), commitment to a decision (Korsgaard et al., 1995), cooperative behaviors (Kim & Mauborgne, 1993; Moorman, 1991), and intention to remain in a relationship (Schaubroeck, May, & Brown, 1994). Thus, procedural justice is likely to have a positive impact on investor attitudes and behaviors important to entrepreneur-investor relationships.

Procedural justice provides a useful framework for understanding entrepreneur-investor relations for several reasons. First, procedural justice helps explain exchange relationships in which one party does not have direct control over decisions, a situation similar to the indirect role investors play in the day-to-day operations of new ventures (Gorman & Sahlman, 1989). Second, the perception of procedural justice is a determinant of the kinds of attitudes and behaviors important to effective entrepreneur-investor relations. Finally, this framework suggests how two core issues in entrepreneur-investor relations, entrepreneurs' provision of timely feedback and investors' influence, affect attitudes and behavior.

Research and theory on procedural justice have identified numerous aspects of decision-making procedures that promote perceptions of procedural justice. We focus on two aspects that are particularly relevant to the context of entrepreneur-investor relations: the entrepreneur's provision of *timely feedback* and the investor's *influence* over decision making. By timely

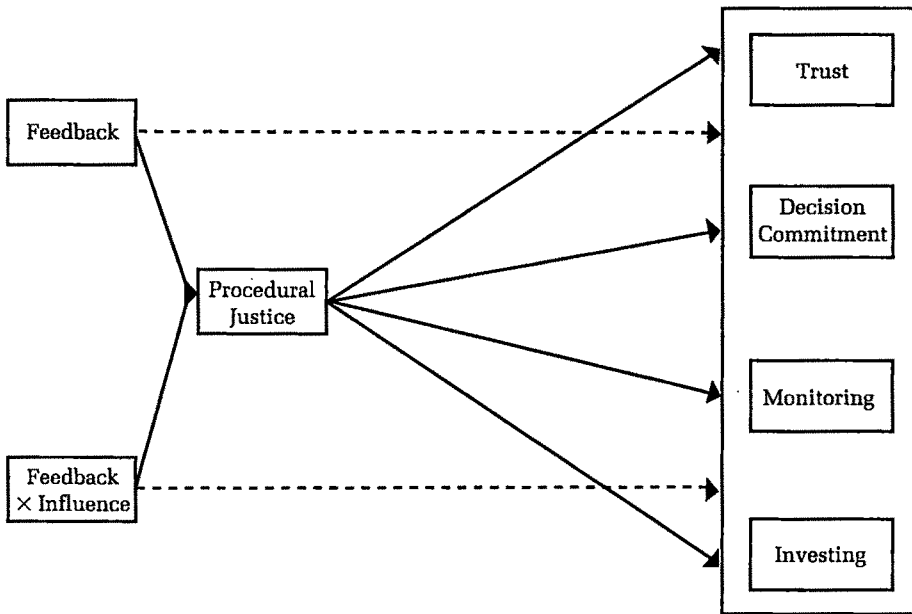
¹ Recently, researchers have begun to distinguish between procedural justice and interactional justice. Whereas procedural justice concerns the fairness of the formal procedures used to make decisions, interactional justice concerns the fairness of the actions of the decision makers enacting those procedures and is thought to include behaviors that are within the discretion of the decision makers, such as providing timely feedback (Moorman, 1991).

feedback, we mean information that allows the investor to stay up to date on the performance of a venture. This information will be on both the good and bad consequences of decisions. Because it demonstrates a willingness to share information, timely feedback is an important sign of a decision maker's openness and honesty. According to procedural justice theory, individuals perceive as just those decision-making procedures that provide assurance that their self-interests are protected. In the context of this study, we examine how CEOs' propensity to provide timely feedback on strategic decisions shapes investors' attitudes and behaviors through procedural justice. Timely feedback operates both on a symbolic level—indicating CEOs' consideration of investor needs—and on a practical level, providing investors with information critical to their ongoing interests.

Influence refers to the extent to which individuals affected by a decision can directly affect the outcome of the decision. Theory suggests that when individuals are unable to directly control the decision, they are more apt to pay attention to the procedures used to make it (Leung & Li, 1990). Because influence provides a means by which individuals can protect their self-interests, when influence is low, the procedures followed to make decisions become more critical. Thus, procedural factors such as timely feedback will have greater impact on perceptions of procedural justice (or a lack thereof) when influence is low. In terms of the issues investigated here, this reasoning suggests that investors will be particularly attuned to the timeliness of feedback when they have little influence over the strategic decisions made by the entrepreneur.

In summary, applying the previously cited research and theory on procedural justice to entrepreneur-investor relations suggests a model, displayed in Figure 1. This model depicts the impact of timely feedback and influence on the following investor attitudes and behaviors: trust in an entrepreneur, commitment to his or her strategic decisions, monitoring of the venture, and willingness to reinvest. The model specifies that timely feedback and influence over decisions jointly affect investors' attitudes and behaviors only through the mediating impact of procedural justice. This model represents a strong assumption regarding the mediating role of procedural justice and thus provides a stringent test of the idea's relevance in this context. That is, because we posit that procedural justice fully mediates the effects of feedback and influence on investor attitudes and behaviors, no direct paths from feedback and influence to these outcomes appear in Figure 1. We do expect influence and feedback to affect investor attitudes and behaviors; however, we expect these relationships to be explained by procedural justice in such a way that no direct effects of feedback and influence will be observed when procedural justice is accounted for. However, in order to test the mediating role of justice, we must first demonstrate that feedback and influence affect investor attitudes and behavior. Below, we describe the rationale for the impact of feedback and influence on investor attitudes and behavior. We then describe the mediating role of procedural justice.

FIGURE 1
Hypothesized Fully Mediated Model^a



^a The dashed lines indicate nonsignificant paths. These lines represent our expectation that feedback and influence will be related to investor attitudes and behavior but that these relationships will not be significant once justice is accounted for.

The Impact of Timely Feedback

Justice theorists have argued that providing timely feedback on the results of decisions is important in creating a sense of procedural justice (Aram & Salipante, 1981; Folger & Bies, 1989). In various decision contexts, such as performance evaluations and hiring, timely feedback enhances perceptions of procedural justice, even when the decisions are unfavorable (Bies, 1986; Folger & Konovsky, 1989; Taylor, Tracy, Harrison, Renard, & Carroll, 1992). In addition, these studies found that timely feedback affected trust in the decision maker and acceptance of decisions (Folger & Konovsky, 1989; Taylor et al., 1992).

Research in the context of entrepreneur-investor relations supports the view that the timeliness of feedback from entrepreneurs will affect investors' perceptions of procedural justice, trust in the entrepreneurs, and commitment to their decisions. Sapienza and colleagues (Sapienza, 1989; Sapienza & Amason, 1993) have shown that the decision-making process affects how satisfied investors are with entrepreneurs and how much conflict the investors perceive in the relationship. A common complaint from venture capital investors is that entrepreneurs are reluctant to share information (Rock, 1987;

Sapienza, 1989). Because investors literally become venture partners with entrepreneurs and reach formal and informal agreements on the provision of feedback (Gladstone, 1988), they are likely to perceive a lack of feedback as an unfair violation of the investment agreement. Such a violation is likely to undermine the investor's trust in the entrepreneur. Further, delayed feedback hampers the investor's ability to evaluate or aid the venture. All other things being equal, investors who receive a great deal of timely feedback are more likely to develop a commitment to the strategic direction a venture is taking than those who are in the dark about what has been happening with the venture. In general, then, we expect that investors who receive less timely feedback will be dissatisfied with the manner in which the entrepreneur is managing the flow of information.

Research and theory on justice in organizations also suggest that decision processes affect the behaviors of those affected by those decisions (Moorman, 1991; Schaubroeck et al., 1994; Sheppard et al., 1992). We expect the timeliness of feedback to affect monitoring and reinvesting. Timely feedback should reduce the need for monitoring, for it provides information that an investor would otherwise have to actively gather. Further, the provision of timely feedback is likely to reduce the monitoring burden for investors because they are less likely to perceive a need to scrutinize data offered openly. Support for this logic can be gleaned from agency theory (Jensen & Meckling, 1976), which might characterize entrepreneurs' provision of timely feedback as a "bonding" mechanism reducing a principal's need to expend effort monitoring. Timely feedback will also reduce investors' uncertainty regarding the future of a venture, enhancing their ability to negotiate a reinvestment price fair to both sides. As a demonstration of openness and honesty, timely feedback also provides a signal to investors that their interests will be protected should they invest additional funds. Finally, like Schaubroeck and colleagues (1994), Larson (1992) argued that relationships with both an economic and a social bond are likely to endure.

In summary, we have argued that investors are affected by the substantive and symbolic value of the information they receive from entrepreneurs. Specifically, when entrepreneurs provide timely feedback, investors are likely to perceive them as following just decision procedures, to trust them, and to be committed to the strategic direction they wish to pursue. Further, we expect that timely feedback will also reduce investors' propensity to monitor ventures and increase their willingness to provide additional funding to them. More formally, our first set of hypotheses is

Hypothesis 1a: The timeliness of feedback on company performance affects investors' perceptions of procedural justice—the more timely an entrepreneur's feedback, the greater an investor's perception of procedural justice.

Hypothesis 1b: The timeliness of feedback on company performance affects investors' trust in an entrepreneur—

the more timely the entrepreneur's feedback, the greater an investor's trust in the entrepreneur.

Hypothesis 1c: The timeliness of feedback on company performance affects investors' commitment to an entrepreneur's decisions—the more timely the entrepreneur's feedback, the greater an investor's decision commitment.

Hypothesis 1d: The timeliness of feedback on company performance affects investors' frequency of monitoring—the more timely an entrepreneur's feedback, the less frequent an investor's monitoring.

Hypothesis 1e: The timeliness of feedback on company performance affects investors' willingness to invest in the venture—the more timely an entrepreneur's feedback, the greater an investor's propensity to reinvest.

The Moderating Impact of Investor Influence

Just procedures provide a means by which individuals can ensure that their interests are protected when they cannot directly control a decision (Thibaut & Walker, 1975). Research has suggested that the less individuals can directly control or influence a decision, the more strongly they react to the procedures used to make it (Korsgaard et al., 1995; Tyler, Rasinski, & Spodick, 1985). Thus, procedural factors such as the timeliness of feedback are likely to have stronger effects when investors have little direct influence over entrepreneurs' decisions.

Both Rock (1987) and Sapienza (1989) emphasized that outside investors with significant stakes in their investments expect to materially influence the strategic direction of their investments. Rosenstein (1988) showed that venture capitalists are actively involved in the strategic decisions made by the CEOs managing their portfolio companies. However, the level of investors' involvement and influence can vary significantly from venture to venture (Gorman & Sahlman, 1989; Sapienza, 1989). Further, Barney, Busenitz, Fiet, and Moesel (1994) found that entrepreneurs' receptivity to advice from outside investors also varies significantly across ventures. Justice theory suggests that when investors believe that their advice is being ignored or that they have little direct influence over decisions, they have little recourse but to focus on signals regarding the procedural justice of decision routines (Leung & Li, 1990).

We argued earlier that timely feedback would be a significant determinant of investors' perceptions of procedural justice and their consequent attitudes and actions. The above logic suggests that the less investors feel they can influence entrepreneurs' decisions, the more important these procedures become. Thus, we expect that the effects of timely feedback on investors' attitudes and behaviors will increase as investors' influence decreases. Specifically, we hypothesize five moderating effects of investors' influence.

Hypothesis 2a: When investors' influence is low, timely feedback from an entrepreneur will have a stronger impact on procedural justice.

Hypothesis 2b: When investors' influence is low, timely feedback from an entrepreneur will have a stronger impact on trust in the entrepreneur.

Hypothesis 2c: When investors' influence is low, timely feedback from an entrepreneur will have a stronger impact on decision commitment.

Hypothesis 2d: When investors' influence is low, timely feedback from an entrepreneur will have a stronger impact on frequency of monitoring.

Hypothesis 2e: When investors' influence is low, timely feedback from an entrepreneur will have a stronger impact on propensity to reinvest.

The Mediating Role of Procedural Justice

Implicit in the previous arguments is the idea that the effect of timely feedback on entrepreneur-investor relations is due to perceptions of procedural justice. Indeed, Korsgaard and colleagues (1995) found that procedural justice partially mediated the impact of decision procedures on attitudes such as decision commitment and trust. Further, perceptions of procedural justice have been linked to behavior as well. In a study of corporate-subsidiary relations, Kim and Mauborgne (1993) found that subsidiaries' perceptions of greater procedural justice on the part of corporate headquarters led subsidiaries to increased cooperative behavior. Schaubroeck and colleagues (1994) found that those who perceived decision procedures as just were less likely to want to terminate relationships. In view of these findings, it appears likely that when investors perceive greater evidence of procedural justice of the part of entrepreneurs, they will trust the entrepreneurs more, be more committed to their decisions, monitor ventures less frequently, and be more inclined to make further capital commitments to the venture. Thus, perceptions of procedural justice should mediate the impact of timely feedback and influence on entrepreneur-investor relations.

Hypothesis 3a: Perceptions of procedural justice mediate the effects of feedback on trust in an entrepreneur.

Hypothesis 3b: Perceptions of procedural justice mediate the effects of feedback on decision commitment.

Hypothesis 3c: Perceptions of procedural justice mediate the effects of feedback on frequency of monitoring.

Hypothesis 3d: Perceptions of procedural justice mediate the effects of feedback on propensity to reinvest.

Hypothesis 4a: Perceptions of procedural justice mediate the interactive effects of feedback and influence on trust in an entrepreneur.

Hypothesis 4b: Perceptions of procedural justice mediate the interactive effects of feedback and influence on decision commitment.

Hypothesis 4c: Perceptions of procedural justice mediate the interactive effects of feedback and influence on frequency of monitoring.

Hypothesis 4d: Perceptions of procedural justice mediate the interactive effects of feedback and influence on propensity to reinvest.

STUDY 1

Methods

Participants and design. A two-by-two within-subjects design was used in which timeliness of feedback (high vs. low) and influence (high vs. low) were manipulated. Subjects were drawn from graduate management courses at a large southern university. Forty-four students voluntarily participated in the study in groups of 10 to 20, acting as investors managing a portfolio of four ventures. Each venture represented a different condition (high feedback/high influence, high feedback/low influence, and so forth), so that subjects were exposed to all four conditions simultaneously.

Task and procedure. We designed a computer simulation based on the extant literature on entrepreneur-investor relations. The simulation is a variation on the Algebra Company (Conlon & Parks, 1990), in which the product of the company is the solution to an equation. An agent (or entrepreneur) is presented with an equation, such as $Y = 2 + a$, and asked to estimate the value of Y . A principal (an investor) is the sole source of capital for buying information that will help solve the equation. Whereas in Conlon and Parks, graduate students served as principals and undergraduates as agents, in this research all subjects took the investor role, and the entrepreneurs' actions were in fact programmed responses. In other words, the computer simulated the role of entrepreneur.

The simulation in this research consisted of three blocks of five trials. To start the game, the investors gave each company \$200 to buy information over the first block of five trials and gave advice to the "entrepreneurs" on a strategy for purchasing information. The investors were told that the entrepreneurs had the option of sending them a comment on the results of the last decision at the end of each trial. Investors could also monitor a company's performance by purchasing an outcome report at a cost of \$20 per inquiry. At the end of the block of trials, investors received a general summary of each company's performance, which consisted of a simple statement indicating whether the company lost money, broke even, or earned

money during that block of five trials. Investors then had another opportunity to invest in and give advice to each company, and the next block of trials began. The same procedure was followed for the second and third blocks of trials. At the end of the third block, investors learned how much they had made (company earnings minus information investments and monitoring purchases). All communications were conducted through the computer, and subjects were physically separated so that they could not talk to each other. To provide an incentive, we told subjects that they were competing against all other subjects to make the most money and that the winner would be announced in their next class meeting. The simulation lasted approximately 30 minutes; subjects then completed a brief questionnaire concerning their perceptions of the entrepreneurs and were debriefed.

Prior to starting, we demonstrated the simulation from the perspectives of both entrepreneur and investor. Subjects were told that the computer simulation was networked and that they would be interacting with other subjects in the room. Subjects were told that some would assume the role of entrepreneur and others would take the role of investor, but as noted above, in reality all subjects were given the role of investor. We controlled the simulation so that each of the four entrepreneurs represented different levels of feedback and influence; the companies' performance was also controlled, with all companies performing poorly in the first block of trials, breaking even in the second, and making money in the third. This trend across the blocks was designed to reflect the performance pattern of new ventures. Performance differences between companies were random and trivial.

Manipulations. *Influence* was manipulated by varying the extent to which entrepreneurs followed subjects' advice. As investors, subjects were told that they should advise entrepreneurs on how to buy information. Subjects were presented with a menu offering four buying strategies, all of which involved buying information in later rather than earlier trials. Two of the entrepreneurs followed this advice; the other two followed a strategy that was in direct opposition to the strategy recommended by the subject.

Timeliness of feedback was manipulated by having two of the entrepreneurs provide a feedback comment after each trial and two provide no comments. Subjects were led to believe that entrepreneurs could choose from a menu of comments indicating the result of the last decision or could send no comment. At the end of each block of trials, the simulation provided subjects with a summary of the company's performance over the last five trials. Thus, subjects received the performance data on all companies; only the timeliness of the feedback varied.

Measures. After the simulation, subjects completed a questionnaire assessing perceptions related to each entrepreneur. All items are listed in the Appendix. *Procedural justice* was measured by two 7-point Likert-type items assessing perceptions of the extent to which the entrepreneur treated the subject fairly in the course of decision making. We adapted these items from Lind, Kurtz, Musante, Walker, and Thibaut (1980). *Trust in the entrepre-*

TABLE 1
Means, Standard Deviations, Correlations, and Reliabilities for Variables
in Study 1^a

Variable	Mean	s.d.	1	2	3	4	5	6
1. Feedback ^b	0.50	0.50						
2. Influence ^b	0.50	0.50	.00					
3. Procedural justice	4.45	1.47	.36	.75	(.86)			
4. Trust in entrepreneur	4.09	0.72	.77	.57	.83	(.83)		
5. Decision commitment	4.35	0.63	.38	.62	.91	.94	(.80)	
6. Frequency of monitoring	3.82	2.87	-.62	-.13	-.29	-.54	.27	
7. Investing	297	60.2	.50	.11	.64	.77	.72	-.69

^a Mean within-subjects correlations are reported. Correlations of .25 or larger are significant at $p < .10$. Correlations of .30 or larger are significant at $p < .05$. Reliabilities are reported in parentheses.

^b Feedback and influence are coded 1 = high, 0 = low.

neur, adapted from Roberts and O'Reilly (1974), was measured by three 7-point items assessing subjects' trust in the entrepreneur. *Commitment to decisions* was measured by two 7-point Likert-type items adapted from Earley and Lind (1987) regarding subjects' commitment to the decisions made by the entrepreneur. *Monitoring* was assessed by the number of times subjects inquired about the performance of the company. Subjects could inquire on a company's performance as often as they desired. *Investing* was measured by the total amount of money subjects invested in a venture across all trials.

A single 7-point Likert-type item, measuring the extent to which subjects thought the entrepreneur provided them with timely feedback, served as the manipulation check for feedback. Two 7-point Likert-type items assessing the perceived influence subjects had over entrepreneurs' decisions served as the manipulation check for influence. Table 1 gives descriptive statistics, reliabilities, and correlations for all measures; in terms of reliability, all the multi-item measures had an acceptable coefficient alpha of .70 or better (Nunnally, 1978). Table 2 reports means for each condition.

Results of Study 1

Analysis of manipulation checks revealed that both manipulations were successful. Subjects reported that entrepreneurs in the high-feedback condition provided significantly more timely feedback than entrepreneurs in the low-feedback condition ($\text{mean}_{\text{high}} = 6.09$, $\text{mean}_{\text{low}} = 1.91$; $t_{43} = 13.96$, $p < .01$). Subjects indicated that they had significantly greater influence over entrepreneurs in the high-influence condition than over those in the low-influence condition ($\text{mean}_{\text{high}} = 4.31$, $\text{mean}_{\text{low}} = 2.57$; $t_{43} = 4.90$, $p < .01$).

To assess the effects of feedback and influence on attitudes and behavior, we first assessed the impact of the independent variables on all dependent variables simultaneously using a doubly multivariate analysis of variance

TABLE 2
Cell Means and Standard Deviations for Dependent Variables in Study 1

Dependent Variable	Low Influence				High Influence			
	Low Feedback		High Feedback		Low Feedback		High Feedback	
	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Procedural justice	3.40	1.21	4.07	1.36	5.03	1.35	5.28	1.14
Trust in entrepreneur	2.82	1.02	4.36	1.35	4.03	1.32	5.14	1.24
Decision commitment	3.45	1.22	4.19	1.40	4.73	1.48	5.02	1.22
Frequency of monitoring	5.12	3.33	2.93	3.62	4.65	3.39	2.58	3.21
Investing	248	109	322	71.9	299	78.1	323	87.9

(MANOVA). These results, summarized in Table 3, show a main effect of feedback on all variables. To determine the specific nature of these effects, separate repeated-measures MANOVAs were then conducted on each dependent variable; these are also summarized in Table 3.

TABLE 3
Results of Within-Subjects MANOVAs for Feedback and Influence Effects in Study 1

Analyses	Independent Variable	F	df	eta ²
Doubly multivariate analysis	Feedback	16.90***	37	.70
	Influence	5.88***	37	.44
	Feedback × influence	1.29	37	.15
Individual analyses Procedural justice	Feedback	16.11***	43	.27
	Influence	22.84***	43	.35
	Feedback × influence	3.80 [†]	43	.08
Trust in entrepreneur	Feedback	63.54***	43	.60
	Influence	18.58***	43	.30
	Feedback × influence	4.28*	43	.09
Decision commitment	Feedback	10.29**	43	.19
	Influence	14.24***	43	.25
	Feedback × influence	2.25	43	.05
Frequency of monitoring	Feedback	25.63***	42	.38
	Influence	2.97 [†]	42	.07
	Feedback × influence	0.05	42	.00
Investing	Feedback	22.88***	43	.35
	Influence	4.24*	43	.09
	Feedback × influence	5.77*	43	.12

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

Results supported all the hypothesized effects of timely feedback. Hypothesis 1a predicts that timely feedback will affect perceptions of procedural justice. As Table 3 indicates, investors thought entrepreneurs who provided timely feedback treated them more fairly than those who did not ($\text{mean}_{\text{high}} = 4.68$, $\text{mean}_{\text{low}} = 4.22$). Hypothesis 1b, that timely feedback would increase trust, was also confirmed ($\text{mean}_{\text{high}} = 4.75$, $\text{mean}_{\text{low}} = 3.42$), as were Hypothesis 1c, that timely feedback would result in greater commitment to the entrepreneurs' decisions ($\text{mean}_{\text{high}} = 4.61$, $\text{mean}_{\text{low}} = 4.09$), Hypothesis 1d, that feedback would reduce monitoring, ($\text{mean}_{\text{high}} = 4.89$, $\text{mean}_{\text{low}} = 2.76$), and Hypothesis 1e, that feedback would positively affect investing ($\text{mean}_{\text{high}} = 323$, $\text{mean}_{\text{low}} = 273$).

Hypotheses 2a–2e predict that the effects of feedback will be stronger when influence is low. This relationship was not supported for decision commitment (Hypothesis 2c) or for frequency of monitoring (Hypothesis 2d). A marginally significant interaction of feedback and influence was observed for perceptions of procedural justice (Hypothesis 2a), and the pattern of means, reported in Table 2, was in the hypothesized direction. Further, trust was significantly affected by the interaction of feedback and influence (Hypothesis 2b). A post hoc contrast on mean trust ratings, reported in Table 2, also supported the hypothesis. Specifically, timely feedback had a stronger positive impact on trust in the low-influence condition. Finally, the interaction of feedback and influence had a significant effect on investing (Hypothesis 2e). A post hoc contrast of the group means indicated that the impact of feedback on investing was more positive in the low-influence condition than in the high-influence condition.

Hypotheses 3a–3d and Hypotheses 4a–4d predict that perceptions of procedural justice will mediate the impact of feedback (3a–3d) and the impact of the interaction of feedback and influence (4a–4d) on trust, commitment, monitoring, and investing. According to Baron and Kenny (1986), mediation is demonstrated when three conditions are met. First, the predictors (feedback and the interaction of feedback and influence) must be related to the mediator (procedural justice). The previously reported MANOVA for procedural justice supports this condition. Second, the mediator must be related to the dependent variables (commitment, trust, monitoring, and investing). This condition was supported by correlations reported in Table 1, indicating that all relationships between procedural justice and the dependent variables were significant, except for the correlation between procedural justice and monitoring, which was marginally significant. Third, the previously significant relationship between the predictor variables and dependent variables should be eliminated or substantially reduced when the mediator is accounted for. To test this condition, we conducted a series of multivariate analyses of covariance (MANCOVAs) with procedural justice (the mediator) as the covariate; the results of these tests are elaborated below. When these three conditions had been met and evidence of mediation thus obtained, we estimated the indirect effects of the independent variables (Baron & Kenny,

1986).² A significant indirect path coefficient at this step provides final evidence of mediation.

The previous analyses indicated that both the main effect of feedback and the interaction of feedback and influence were significant predictors of trust. When procedural justice was introduced as a covariate, the main effect of feedback was still significant ($F_{1,42} = 34.46, p < .01$), although the magnitude of this effect was notably smaller (without justice as a covariate, $\eta^2 = .60$; with justice as a covariate, $\eta^2 = .45$). Further, the indirect path of feedback via procedural justice was significant ($b = .257, t_{39} = 2.07, p < .05$). This result indicates that procedural justice partially mediates the impact of feedback on trust (Hypothesis 3a). The interaction of feedback and influence was no longer significant when procedural justice was included as a covariate ($F_{1,42} = 2.51, n.s.; \eta^2 = .06$), suggesting that procedural justice may also mediate the impact of feedback and influence on trust. However, the indirect path of the interaction was not significant ($b = .046, t_{39} = 1.14, n.s.$), indicating that perceptions of procedural justice did not mediate the joint effect of feedback and influence (Hypothesis 4a).

The previous analysis indicated that for decision commitment the main effect of feedback was significant. When procedural justice was included as a covariate, this effect was no longer significant ($F_{1,42} = 0.60, n.s.; \eta^2 = .01$), and the indirect path of feedback (through procedural justice) was significant ($b = .401, t_{39} = 3.10, p < .05$). Thus, the impact of feedback on decision commitment was fully mediated by perceptions of procedural justice (Hypothesis 3b). Because the interaction of feedback and influence was not significantly related to decision commitment, no test of mediation was possible for this variable (Hypothesis 4b).

Previously, feedback was shown to have a direct effect on the frequency of monitoring. When procedural justice was included as a covariate, the effect remained significant ($F_{1,40} = 21.2, p < .01$; without justice, $\eta^2 = .38$; with justice, $\eta^2 = .35$), and the indirect path was not significant ($b = .211, t_{39} = 0.77, n.s.$). Thus, the hypothesized mediating role of procedural justice was not supported for the frequency of monitoring (Hypothesis 3c). The lack of an interaction effect of feedback and influence on monitoring made a test of mediation unnecessary (Hypothesis 4c).

Without perceptions of procedural justice accounted for, both the main effect of feedback and the interaction of feedback and influence had a significant effect on investing. With justice included as a covariate, the main effect of feedback was still significant, though notably smaller ($F_{1,41} = 7.65, p <$

² The indirect path coefficient is determined by the product of the direct effects: $b_{\text{indirect effect}} = b_1 \times b_2$, where b_1 is a path coefficient for the effect of the independent variable on the mediator and b_2 is a path coefficient for the effect of the mediator on the dependent variable. The significance test for the indirect path coefficient is determined by this coefficient by its standard error. This test is t -distributed. The standard error of the path coefficient is computed as follows: $\sqrt{b_1^2 s_2^2 + b_2^2 s_1^2 + s_1^2 s_2^2}$, where s_1 is the standard error for path coefficient b_1 and s_2 is the standard error for path coefficient b_2 .

.01; without justice, $\eta^2 = .35$; with justice, $\eta^2 = .16$), and the indirect path of feedback was significant ($b = 15.7$, $t_{39} = 2.15$, $p < .05$). These results indicate that procedural justice partially mediated the impact of feedback on investing (Hypothesis 3d). Finally, although the feedback-by-influence interaction was no longer significant when procedural justice was added to the equation ($F_{1,41} = 2.22$, n.s.; without justice, $\eta^2 = .12$; with justice, $\eta^2 = .05$), neither was the indirect path ($b = 8.66$, $t_{39} = 1.57$, n.s.). This result suggests that procedural justice did not mediate the joint effect of feedback and influence on investing (Hypothesis 4d).

In summary, the mediation analyses revealed that procedural justice partially or fully mediated the impact of feedback on trust (Hypothesis 3a), commitment (Hypothesis 3b), and investing (Hypothesis 3d). However, procedural justice did not affect the impact of feedback on monitoring (Hypothesis 3c). Further, procedural justice did not mediate the effects on trust and investing of the feedback-by-influence interaction (Hypothesis 4a and Hypothesis 4d, respectively).

Discussion

The purpose of Study 1 was to examine the causal impact of the timeliness of feedback and influence on entrepreneur-investor relations. Hypothesis 1, concerning the main effect of feedback, received strong support for all variables. Timely feedback provided by an entrepreneur led investors to feel the entrepreneur's decision making style was just, to trust the entrepreneur, to be committed to the entrepreneur's decisions, to monitor the venture less frequently, and to invest more resources in the venture.

Hypotheses concerning the moderating effect of influence (2a–2e) were supported for procedural justice, trust, and investing but not for decision commitment or monitoring. These results suggest that when investors have little decision control, timely feedback is particularly important to their perceptions of fairness, their trust, and their willingness to reinvest. For decision commitment and monitoring, feedback appears important regardless of the degree of investors' influence. Another explanation is that subjects in the experiment had not developed high expectations about entrepreneurs' following their advice. It is also possible that the ease of monitoring in the simulation may have limited our ability to detect a moderating effect of influence. That is, although subjects had to "pay" to monitor ventures, the effort and cost of monitoring were minimal relative to real-world scenarios. Consequently, subjects may have exercised less discretion in choosing to monitor ventures than would actual investors. Subjects may have monitored ventures for which they did not receive timely feedback, regardless of their ability to influence the entrepreneur, simply because it was easy to do so.

The final set of hypotheses, concerning the mediating role of procedural justice (Hypotheses 3a–3d and Hypotheses 4a–4d) received weaker support. Procedural justice partially or fully mediated the impact of feedback on trust, commitment, and investing. This finding suggests that perceptions of procedural justice play an important role in fostering favorable entrepreneur-

investor relationships, although it does not appear to play the same role in the frequency of monitoring. Procedural justice did not mediate the interactive effect of feedback and influence on any of the variables. The joint effects of feedback and influence may directly affect investors' attitudes and behavior. Alternatively, these findings might indicate that factors other than procedural justice play a critical role in determining the nature of these relations. Substantive interpretations of null findings should be made with caution, however. The low power associated with a small sample may cause the mixed findings for Hypotheses 2 and 3. Given the sample size of 44, the power to detect an effect of moderate size is equal to .51. Further research will help clarify the role of procedural justice in the context of investor-entrepreneur relations.

Finally, it is noteworthy that influence had a significant effect on all the dependent variables. Subjects perceived greater procedural justice, trusted the entrepreneur more, monitored less, and invested more when they were able to influence decisions. Given that influence allows for the protection of self-interest, a critical mechanism underlying the effects of procedural justice (Lind & Tyler, 1988), these findings are not surprising.

The experimental design of Study 1 allowed for a rigorous test of the causal impact of feedback and influence on investor attitudes and behavior because it allowed us to introduce the independent variables in a controlled fashion. However, experimental conditions never perfectly mirror real-world situations and may produce limited generalizability. Therefore, in order to ensure the external validity and reliability of the above findings, we conducted a second study, a field survey of venture capitalists concerning how feedback and influence accorded by their entrepreneurial CEOs affected their attitudes and behaviors. Because this study served as a field replication, the same hypotheses were tested as in Study 1.

STUDY 2

Sample and Procedure

The sample consisted of one partner from each of 118 venture capital firms geographically dispersed across the U.S. The mean age of these firms was 11 years, the average capital under management was \$89 million, and the average number of partners/top managers per firm was four. We used *Pratt's Guide to Venture Capital Sources* (Lim & Weissberg, 1994) to obtain the names and addresses of venture capitalists in the 48 contiguous states in the United States. In order to control for possible effects of differences in involvement, monitoring, and investment purposes, we employed several sampling constraints. First, we chose only firms listed as private venture capital firms investing their own funds; thus, we excluded corporate subsidiaries and government-sponsored investment companies such as Small Business Investment Corporations (SBICs). Second, in order to ensure that enough time for relationships to develop had elapsed, we excluded all firms less than two years old. Applying these constraints yielded 408 venture capital

firms. We then sent a survey to a randomly selected member of the top management of each of these firms. To further ensure comparability across the sample, in the letter to the venture capitalists we asked them to respond on a venture that fulfilled the two following conditions: the respondent was on the venture's board of directors and had been so for at least two but not more than five years.

Four surveys were undeliverable and were returned; two others were not completed by venture capitalists because they had no ventures that fulfilled our criteria. The resulting sampling population was 402; we received complete questionnaires from 118 venture capital firms for a response rate of 29 percent. Our response rate is rather high for a sample of this sort; for their surveys of partners of venture capital firms, MacMillan and colleagues (1989) had a response rate of 18 percent. Nonetheless, we compared respondents to nonrespondents on capital under management and venture capital firm age and found no significant differences; thus, we have no reason to believe that nonresponse bias poses a problem in this study.

Measures

The seven variables in this study were constructed from the venture capitalists' responses to a multi-item survey; all responses were on five-point Likert-type scales. The Appendix lists the items. Table 4 displays the means, standard deviations, correlations, and reliabilities for all measures; all the multi-item measures meet an acceptable level of reliability with coefficient alphas of .70 or better (Nunnally, 1978).

Independent variables. Venture capitalists assessed feedback from ventures' CEOs and their own levels of influence on the ventures for the prior 12-month period. *Feedback* was measured by four items developed by us assessing the extent to which CEOs had provided the investor with timely feedback on strategic decisions and venture performance over the prior 12 months. *Influence* was measured by four items assessing the extent to which the venture capitalist could influence the strategic direction and decisions of the CEO; these were adapted from Lind, Lissak, and Conlon (1983).

Dependent variables. *Procedural justice* was measured by four items adapted from Lind and colleagues (1980) assessing the fairness of the procedures used by a CEO to conduct board meetings and make strategic decisions. The four-item measure of *trust*, adapted from Roberts and O'Reilly (1974), concerned venture capitalists' assessment of the extent to which they believed a CEO to be honest, sincere, and trustworthy. *Commitment to decisions*, based on Earley and Lind (1987), was measured by three items assessing the extent to which venture capitalists supported the strategic directions taken by the CEOs. *Frequency of monitoring* was measured by two items assessing the extent to which the investors sought additional performance reports and documentation, and *investing* was measured by four items assessing whether they had taken or would take every opportunity to invest in the venture. We developed these final two measures for this study.

TABLE 4
Means, Standard Deviations, Correlations, and Reliabilities for All Variables in Study 2^a

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10
1. Years since investment	3.83	2.36										
2. New venture experience	0.36	0.48	-.13									
3. Years of experience	13.42	7.61	-.16	.19								
4. Feedback	4.27	0.75	.11	.02	.01							
5. Influence	3.92	0.69	.06	-.07	-.03	.43	(.93)					
6. Procedural justice	4.06	0.78	.06	-.01	.01	.65	.30	(.95)				
7. Trust in entrepreneur	4.32	0.76	.16	.02	.02	.74	.46	.63	(.89)			
8. Decision commitment	4.27	0.80	-.03	.08	.06	.55	.38	.64	.59	(.94)		
9. Frequency of monitoring	3.35	1.02	-.13	.07	-.03	-.16	-.01	-.20	-.23	-.20	(.78)	
10. Investing	3.43	1.29	-.19	-.10	-.04	.03	.14	.14	.07	.09	-.05	(.87)

^a Correlations greater than .15 are significant at $p < .10$. Correlations greater than .19 are significant at $p < .05$. Reliabilities are reported in parentheses.

Control variables. Because most venture capital firms cash out of a given venture in three to five years (Bygrave & Timmons, 1992), the length of the investment relationship will place restrictions on reinvestment. Consequently, we used the *years since the initial investment* as a control variable. Because trust can also be affected by perceptions of an entrepreneur's competence and experience (Sapienza & Gupta, 1994), we also included two indicators of an entrepreneur's experience as control variables: *CEO's years of industry experience* and *CEO's prior new venture experience* (coded 0 = no, 1 = yes).

Results of Study 2

We used LISREL 7 (Jöreskog & Sörbom, 1989) to test all hypotheses via path analyses. This procedure allows for both omnibus tests of sets of hypotheses (to assess how well the model as a whole fits the data) and individual tests of specific hypotheses (to assess whether specific paths are significant). Table 5 reports the results of model tests. This table presents three fit indexes: the goodness-of-fit index (GFI), the normal fit index (NFI; Bentler & Bonnett, 1980), and the chi-square goodness-of-fit test. The GFI assesses the correspondence between the observed and hypothesized covariances. Values greater than .90 are considered indicative of good fit; however, more complex models are likely to yield inflated GFIs. The NFI provides an index of the model fit relative to a null model (i.e., a model in which no relationships are hypothesized). Values greater than .80 are considered indicative of good fit. The chi-square goodness-of-fit test assesses whether the observed relationships differ significantly from the hypothesized model. A nonsignificant chi-square indicates a good fit; however, the test is sensitive to the complexity of the model. To make a more definitive assessment of model fit, we directly compared models by conducting nested model tests (Loehlin, 1987).

Nested model tests involve comparing the chi-squares of models that differ in the number of paths hypothesized. A significant difference in chi-square indicates that the more complex model provides a better fit. We analyzed four nested models: (1) a null model, whereby no relationships are posited, (2) a direct model, in which only direct effects of the independent variables on all dependent variables are posited, (3) an indirect model, in which only indirect effects of the independent variables via procedural jus-

TABLE 5
Results of Path Model Tests for Study 2

Model	χ^2	df	GFI	NFI	Comparison	χ^2_{diff}	df _{diff}
1. Null	264.31*	40	.66				
2. Direct	39.75*	10	.93	.85	2 vs. 1	224.57*	30
3. Indirect	74.91*	18	.89	.72	4 vs. 3	66.24*	12
4. Saturated	8.67	6	.99	.97	4 vs. 2	31.08*	4

* $p < .05$

tice are posited (the hypothesized model seen in Figure 1), and (4) a saturated model, in which both direct and indirect effects of the independent variables are posited. A significant difference between the chi-squares of the null model and the direct model would provide support for the effects of feedback and the interaction of feedback and influence on the dependent variables (Hypotheses 1 and 2). We tested Hypotheses 3 and 4 by two model comparisons, first comparing the direct model to the saturated model to assess whether a saturated model specifying both direct and indirect effects (i.e., partial mediation) fit the data better than a model specifying direct effects only. Next, we compared the indirect model—our hypothesized model—to the saturated model to test whether a model specifying indirect effects only (i.e., full mediation) fit the data as well as a model specifying direct and indirect effects (i.e., partial mediation). (Note that the indirect model cannot be compared to the direct model, since they are not nested.) Table 5 reports the results of the nested model tests, and Table 6 summarizes the results for specific paths.

Hypotheses 1a–1e predict that timely feedback will affect investors' perceptions of procedural justice, trust in an entrepreneur, commitment to

TABLE 6
Unstandardized Path Coefficients for Study 2^a

Variables	Direct Model	Indirect Model	Saturated Model
Direct effects of feedback			
Procedural justice	0.91*	0.91*	0.91*
Trust	1.21*		1.21*
Decision commitment	0.68 [†]		0.70
Monitoring	-1.33*		-1.33*
Investing	0.77		0.77
Direct effects of feedback × influence			
Procedural justice	-0.07	-0.07	-0.07
Trust	-0.15*		-0.15 [†]
Decision commitment	-0.05		-0.05
Monitoring	0.30*		0.30*
Investing	-0.22		-0.22
Direct effects of procedural justice			
Trust		0.61*	0.25*
Decision commitment		0.61*	0.41*
Monitoring		-0.27*	-0.22
Investing		0.27*	0.33 [†]
Indirect effects of feedback			
Trust			0.23*
Decision commitment			0.37*
Monitoring			-0.20
Investing			0.29

^a Years since investment, new venture experience, years of experience, and influence were included in each model as control variables. Since these variables were not of substantive interest, their effects are not listed in this table.

[†] $p < .10$

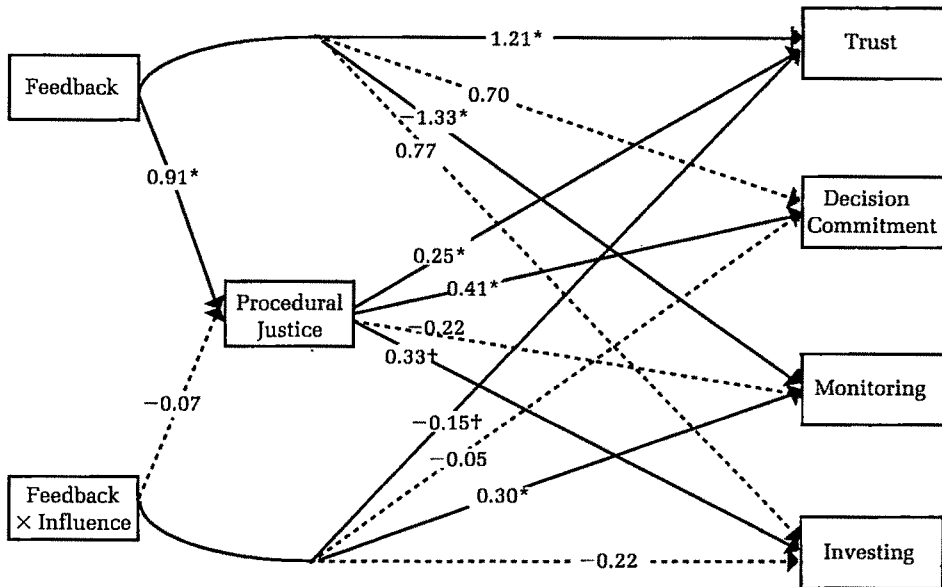
* $p < .05$

decisions, frequency of monitoring, and investing. Hypotheses 2a–2e predict that feedback will have a stronger impact on all five dependent variables when influence is low. We first simultaneously tested these hypotheses by examining the fit of the direct model. As Table 5 indicates, the direct model provided a fit superior to that of the null model ($X^2_{\text{diff}} = 224.57, p < .05$). The fit indexes also suggested that the direct model provided a good fit to the data (GFI = .93; NFI = .85). An examination of specific paths, however, provided only qualified support for the model. As the first column of Table 6 shows, feedback had a significant effect on all variables except investing (Hypotheses 1e), and it had a marginally significant impact on commitment (Hypotheses 1c). Thus, three of the first five hypotheses were fully supported; one was marginally supported. The interaction of feedback and influence, on the other hand, was significant for two: trust (Hypotheses 2b) and monitoring (Hypotheses 2d). To illustrate the interaction effect on trust, we performed a median split on influence and computed the correlation between feedback and trust for investors with high influence and investors with low influence (Cohen & Cohen, 1983). The pattern of subgroup correlations supported the hypothesized relationship, in that the positive impact of feedback on trust was stronger when influence was low ($r = .76$) than when influence was high ($r = .65$). Similarly, we interpreted the interaction effect on monitoring by computing subgroup correlations between feedback and monitoring for investors with high and low influence. As expected, the negative impact of feedback on monitoring was stronger when influence was low ($r = -.40$) than when it was high ($r = .04$). Thus, the hypothesized interaction of feedback and influence received support for two of the five dependent variables.

The final set of hypotheses predicts that procedural justice will mediate the impacts of feedback (Hypotheses 3a–3d) and of feedback times influence (Hypotheses 4a–4d) on trust, commitment, monitoring, and investing. First, we compared nested models to assess all mediation hypotheses simultaneously. As Table 5 indicates (comparisons 4 vs. 3 and 4 vs. 2), the saturated model provided a fit significantly superior to both the direct model ($\chi^2_{\text{diff}} = 31.08, p < .05$) and the indirect model ($\chi^2_{\text{diff}} = 66.24, p < .05$). These analyses suggest that a partial mediation model (i.e., both direct and indirect effects of predictors) provided the best fit of the data. Figure 2 displays the saturated model and its path coefficients.

To demonstrate mediation for specific relationships, we examined the three conditions necessary for mediation (explained above in the context of Study 1). We assessed the condition that the predictor variables be related to the mediator by the path coefficients for the direct model. The first column of Table 6 shows that feedback was significantly related to procedural justice but that feedback times influence was not. Therefore, procedural justice could mediate the effects of feedback, but it could not mediate the interactive effects of feedback and influence; thus, no tests of Hypotheses 4a–4d were conducted. The significant relationship between procedural justice and all dependent variables in the indirect model (see column 2 of Table 6) satisfied the second condition for mediation. We assessed the third condition (a sub-

FIGURE 2
Study 2 Path Analysis Results for a Saturated Model^a



^a Solid lines indicate significant paths. Dashed lines indicate nonsignificant paths.

† $p < .10$

* $p < .05$, one-tailed test

stantial reduction of relationships between the predictor and dependent variables when the mediator is included) by examining the direct paths for feedback in the saturated model (see column 3 of Table 6). Finally, we examined the significance of the indirect paths when all three conditions were met.

The direct effect of feedback on trust, significant in the direct model, was still significant in the saturated model, indicating that procedural justice did not fully mediate the impact of feedback. However, in the saturated model, the indirect effect of feedback (through procedural justice) on trust was significant. Together, these results suggest that procedural justice partially mediated the impact of feedback on trust (Hypotheses 3a). Feedback was marginally related to commitment in the direct model. In the saturated model, the direct effect of feedback was not significantly related to commitment, and its indirect effect was significant. Therefore, the marginal impact of feedback on commitment was fully mediated by procedural justice (Hypotheses 3b). Feedback was related to monitoring in both the direct and the saturated models; the saturated model shows that the indirect effect of feedback on monitoring was not significant. Thus, procedural justice did not mediate the impact of feedback on monitoring (Hypotheses 3c). Because the interaction of feedback and influence did not significantly affect investing, mediation was not possible (Hypotheses 3d).

In summary, the tests for mediation suggested that a model specifying partial mediation provided the best fit for the data. Tests of specific paths revealed that procedural justice partially mediated the impact of feedback on trust and fully mediated the impact on commitment. Although procedural justice was significantly related to all four dependent variables, it did not mediate the impact of feedback on monitoring or the interactive effect of feedback and influence on trust or monitoring.

Discussion

The purpose of Study 2 was to replicate the experimental findings of Study 1 in a field setting. With some notable exceptions, the two studies produced results consistent with one another and with expectations derived from procedural justice theory. Table 7 displays the results of the two studies. As in the first study, Hypothesis 1, concerning the main effect of feedback, received strong support in Study 2. Specifically, timely feedback from an entrepreneur led investors to feel the entrepreneur was fairer, to trust the entrepreneur more, to be more supportive to the entrepreneur's strategic decisions, and to monitor the venture less frequently. The findings concerning the moderating effect of influence (Hypothesis 2) were less clear. In both

TABLE 7
Summary of Findings for Study 1 and Study 2

Hypothesis	Study 1	Study 2
1. Main effect of feedback on		
a. Procedural justice	Supported	Supported
b. Trust	Supported	Supported
c. Decision commitment	Supported	Marginal
d. Monitoring	Supported	Supported
e. Investing	Supported	Not supported
2. Interactive effect of feedback and influence on		
a. Procedural justice	Marginal	Not supported
b. Trust	Supported	Supported
c. Decision commitment	Not supported	Not supported
d. Monitoring	Not supported	Supported
e. Investing	Supported	Not supported
3. Mediating role for the main effect of feedback on		
a. Trust	Partial mediation	Partial mediation
b. Decision commitment	Full mediation	Full mediation
c. Monitoring	Not supported	Not supported
d. Investing	Partial mediation	Not supported ^a
4. Mediating role for the interactive effect of feedback and influence on		
a. Trust	Not supported	Not supported ^a
b. Decision commitment	Not supported ^a	Not supported ^a
c. Monitoring	Not supported ^a	Not supported ^a
d. Investing	Not supported	Not supported ^a

^a The preconditions for testing these relationships were not met, so no actual tests were conducted.

studies, the moderating effect of influence was only consistently observed for one variable: trust in the entrepreneur. Both studies indicated that feedback had a stronger impact on trust when the investor had relatively low influence on decisions.

Findings concerning the mediating role of procedural justice were largely consistent in the two studies. In both cases, procedural justice partially or fully explained the impact of feedback on investor attitudes, specifically, trust and commitment. As in Study 1, the findings in Study 2 indicated that procedural justice did not mediate the relationship between feedback and monitoring. Moreover, procedural justice did not mediate the effects of the interaction of feedback and influence in either study. Despite the mixed support for the mediating role of procedural justice, the correlations in Table 4 reveal that perceptions of procedural justice were related to all investor attitudes and behaviors except investing. Thus, procedural justice itself appears to be an important determinant of investors' attitudes and behaviors.

Thus, a number of relations derived from procedural justice theory were consistently supported in both the experiment and the field study. Both studies found strong support for the effect of timely feedback on investor attitudes and behavior and for the mediating role of procedural justice in the effects of feedback on investor attitudes. However, some findings were not replicated. The principal difference in the results of the two studies concerned the effects on investor behaviors. In Study 1, the interaction of feedback and influence affected investing but not monitoring, whereas in Study 2, the interaction predicted monitoring. Further, in Study 1, procedural justice partially mediated the impact of feedback on investing; in Study 2, investing was not affected by feedback. These inconsistencies may be explained by the degree of discretion and control investors in each context had over these two behaviors. In Study 1, because of the relatively low cost and ease of monitoring, subjects did not need to limit monitoring to dire cases (i.e., when they received infrequent feedback *and* had little influence). Monitoring in the real-world setting of the second study, however, may be very costly (Barney et al., 1989; Sapienza & Gupta, 1994); thus, venture capitalists exercise discretion in monitoring ventures. The studies also differed in investors' control over investing. In Study 1, the subjects were the sole arbiters of the money invested in ventures. In contrast, venture capitalists' actual discretion over investing may be considerably constrained. For example, they may not be able to act independently of other partners in their firms or even other investors in a syndicate of venture capital firms (Bygrave, 1988). Thus, both studies show that feedback, influence, and procedural justice can affect investors' actions, but such perceptions are more likely to affect behaviors such as monitoring, over which a venture capitalist exercises a high degree of discretion and control.

The findings of both studies also point to some limitations in the model tested. For example, only for trust did the studies strongly support a moderating impact of influence. Thus, although previous research has suggested that procedural factors such as feedback are more important to creating a sense

of fairness and commitment when individuals lack influence over a decision outcome (Korsgaard et al., 1995; Tyler et al., 1985), our findings suggest that receiving timely information may be critical regardless of the investors' level of influence. It may be that because investors hold a position of considerable stature and responsibility, they have very high expectations for how they are to be treated (contrast this to typical hierarchical intraorganizational relationships in which those affected by decisions have lower expectations of input). Thus, it may be that regardless of the level of influence investors exert over a venture, they attend very strongly to how much respect-signaling feedback they receive.

Another important implication raised by the findings of both studies concerns the mediating role of procedural justice. Although perceptions of procedural justice appear to play a role in the impact of information sharing on attitudes, the findings suggest that feedback and influence also directly affect investors' attitudes and behaviors. This is consistent with previous research in which perceptions of procedural justice partially mediated the impact of decision-making procedures on attitudes (Korsgaard et al., 1995). Two important implications can be derived from these findings. First, as others have noted (e.g., Sheppard & Lewicki, 1987), it is likely that other procedural factors affect perceptions of justice. In this investigation, we focused on two procedural factors, feedback and influence. Future research is needed to determine how investors are affected by other aspects of the decision-making process, such as entrepreneurs' justification of action or openness to input.

The second implication is that information sharing and influence may affect investor attitudes and behaviors through some other mechanism, such as the creation of trust. Consistent with research and justice theory (Lind & Tyler, 1988), our findings suggest that trust can be fostered by sharing information and influence in a way that promotes perceptions of procedural justice. However, perceptions of justice do not fully explain the impact of decision-making procedures on trust. For example, research on agency theory suggests that investors' perceptions will also be affected by issues other than fairness and integrity, such as perceived competency (Sapienza & Gupta, 1994). An alternative model to the one we hypothesized, one that also recognizes an intervening role for both trust and procedural justice, may more fully explain the dynamics of investor-entrepreneur relations. Our results suggest that such models merit exploration in future research.³

³ We explored an alternative model in which both procedural justice and trust were posited to mediate the impact of our predictors on commitment, monitoring, and investing. This model also allowed for procedural justice to partially mediate the impact of the independent variables on trust. We tested the model on the data from Study 2. The results indicated that it provided a good fit to the data ($\chi^2_{12} = 10.92$, $GFI = .98$, $NFI = .96$) and was superior to the indirect model displayed in Figure 1. Although these findings are purely exploratory, the superior fit of this model and that of the saturated model suggest that a more complex model may be needed to fully explain investor-entrepreneur relations.

CONCLUSION

Employing an experiment and a field study, we examined how entrepreneurs' management of information flows affected investors. Our findings revealed that timely feedback promoted positive relations between entrepreneurs and investors. Past studies had revealed the importance of social control in interfirm relations (Larson, 1992; Ring & Van de Ven, 1994) but had not demonstrated how such relations could be fostered. Our two studies provide strong evidence of the usefulness of procedural justice theory for understanding entrepreneur-investor relations. Drawing on the theory, we were able to develop a model that explained significant proportions of the variation in investors' attitudes and behavior. At the same time, our results suggest that modifications in the existing theory may be needed to accurately portray these types of relations.

This study helps clarify the mechanisms of control and information sharing in the venture-building process. Because of the uncertainty facing new ventures, entrepreneurs and investors who can create mutual trust and commitment can perhaps mitigate fears of opportunism (Williamson, 1975), reduce the costs of delegation of decision making (Jensen & Meckling, 1976), and create a "cooperative advantage" over competitors (Smith, Carroll, & Ashford, 1995).

Our findings support and extend recent work in procedural justice. For example, the results indicate that influence does moderate the effects of perceptions of fairness: fairness is especially important for those who have little control over decisions (Korsgaard et al., 1995; Tyler et al., 1985). The findings also demonstrate the generalizability of the theory to interfirm and nonhierarchical relationships and to complex, organization-wide decisions. However, this research and that of Korsgaard and colleagues (1995) found that although procedural justice is a powerful predictor of attitudes of strategic decision makers, it only partially mediates the relationships predicted. These findings suggest that the theory bears refinement when applied to settings involving high outcome uncertainty and ambiguous or nonhierarchical relationships.

We have also gained some insight into how entrepreneurs might manage their dilemma regarding the flow of information to investors. Venture capitalists attribute most venture failures to managerial inadequacies (Gorman & Sahlman, 1989), and they play an active role in replacing CEOs (Bruton, Fried, & Hisrich, 1994). Should CEOs provide continual feedback on the ups and downs of a business, or will such actions sacrifice informational advantages, endanger their positions, and undermine their authority for no appreciable gain? Our results suggest, paradoxically, that entrepreneurs maintain control by yielding a level of control. That is, the more entrepreneurs share information, the more apt investors are to eschew monitoring, to trust that the entrepreneurs will be honest, and to support the entrepreneurs' decisions. Larson labeled social control "a binding agent providing both the freedom and the control necessary for collaboration" (1992: 91). Our results

provide some insight into how the paradox of freedom and control might be reconciled.

Experiments and field surveys have inherent limitations. However, employed together, they help mitigate some concerns about causality, generalizability, and external validity. Nonetheless, it is as yet unclear how broadly our results can be generalized. Studies involving a larger sample may resolve whether the lack of statistical power masked significant relationships. The results clearly suggest that feedback, influence, and procedural justice are important determinants of investor behavior and attitudes, but further study is needed to flesh out the model and resolve the inconsistencies in findings.

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APPENDIX

Items in Study 1

Procedural justice

To what extent was the owner fair in the way he/she made decisions?

To what extent were you satisfied with the way the owner made decisions concerning the company?

Trust in owner

To what extent was the owner honest in his/her dealings with you?

To what extent do you trust the owner?

When the owner made decisions that were different from decisions I would make, I trusted that the owner had good reasons for making these decisions.

Commitment to decisions

To what extent were you satisfied with the decisions made by the owner?

If the game were a situation you and the owner were actually facing, how committed would you be to the decisions made by the owner?

Feedback manipulation check

To what extent did the owner give you timely feedback on the company's performance?

Influence manipulation check

- To what extent did you influence the way this owner made decisions?
- To what extent could you control how the owner made decisions?

Items in Study 2*Feedback*

- To what extent did the CEO:
 - provide you with timely feedback on the performance of the venture?
 - provide you with timely feedback on the consequences of strategic decisions he/she made?
 - keep you up-to-date on the performance of the venture?
 - keep you up-to-date on the strategic direction of the venture?

Influence

- To what extent did the CEO take your advice in making strategic choices about the venture?
- To what extent did the CEO ignore your advice in making strategic choices about the venture?
(reverse-coded)
- To what extent could you influence strategic decisions made by the CEO?
- To what extent did you influence the strategic direction of the venture?

Procedural justice

- The procedures used by the CEO during board meetings over the last 12 months were fair.
- I am satisfied with the procedures used by the CEO during board meetings.
- The procedures used by the CEO to conduct board meetings were fair.
- I am satisfied with the way the CEO conducted board meetings.

Trust in the CEO

- The CEO is honest in his/her dealings with me.
- I trust the CEO.
- The CEO is sincere in his/her attempt to understand my point of view.
- Taking all things into consideration, I am satisfied with the CEO.

Commitment to decisions

- Considering the strategic decisions made by the CEO over the last 12 months:
 - I support the strategic decisions.
 - I support the course of action decided upon.
 - I have supported the strategic decisions that were made.

Frequency of monitoring

- To keep abreast of the progress of the venture, to what extent do you:
 - request additional reports or explanations for venture performance?
 - request documents be provided to supplement reports provided by the venture?

Investing

- My firm has taken advantage of every opportunity to re-invest in this venture.
- My firm would like to re-invest in the venture in the future if there is an opportunity to do so.
- Since we first invested in this venture, we have participated in every opportunity to invest in the venture.
- We intend to re-invest in the venture if there is an opportunity to do so.

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INFORMATION-PROCESSING DEMANDS AS A DETERMINANT OF CEO COMPENSATION

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Early research found little relationship between CEO pay and firm performance. Therefore, recent work on CEOs' compensation has focused less on the substantive nature of the job performed by such executives and more on the social and political context in which their pay is set. This study returns attention to the substantive nature of CEOs' jobs. Specifically, we argue that CEOs are paid for the level of information processing that their jobs require. Results from four industries support this view: chief executive compensation was higher in firms whose diversification strategy, approach to technology, and top management team structure placed particularly high information-processing demands on their CEOs.

In recent years, the topic of chief executive compensation has received tremendous attention in the business press. Graef Crystal expressed the view dominant in this medium, observing that "just about all of the rational factors you can think of, taken together, don't play a big role in determining CEO pay . . . top level compensation doesn't make much sense" (1988: 68). Moreover, because academics have typically found weak or nonexistent relationships between chief executive pay and firm performance (Deckop, 1987; Gomez-Mejia, Tosi, & Hinkin, 1987; Kerr & Bettis, 1987; O'Reilly, Main, & Crystal, 1988), compensation researchers have begun to focus on a number of social and political explanations for executive pay. For example, recent work has investigated the impact on pay of such factors as CEO tenure (Finkelstein & Hambrick, 1989; Hill & Phan, 1991), information and power asymmetries among principals and agents (Gomez-Mejia et al., 1987; Tosi & Gomez-Mejia, 1989), social comparison processes among CEOs and boards of directors (O'Reilly et al., 1988), and the influence of social diffusion processes in shaping the latest "fashions" in executive compensation (Davis, 1991; Finkelstein & Hambrick, 1988).

In contrast to this recent trend, the present study focuses attention on the substantive nature of the job undertaken by CEOs. In particular, we argue that CEOs are paid in accordance with the information-processing demands that their jobs place upon them. A number of factors undoubtedly contribute

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to the information-processing demands confronting top executives (e.g., Daft & Lengel, 1986; Galbraith, 1973; Thompson, 1967). However, a common theme running through such research is that those demands are significantly affected by three firm-level factors: (1) the number and interdependence of a firm's business activities, (2) the technologies the firm employs, and (3) the management structure used to administer the firm (Chandler, 1962; Daft & Lengel, 1986; Galbraith, 1973, 1974; Gresov, 1989; Hill & Hoskisson, 1987; Jones & Hill, 1988; Kotter, 1982; Lawrence & Lorsch, 1967; Thompson, 1967). Consequently, this study addresses information-processing demands that derive from technology, management structure, and the number and interdependence of business activities. In our view, information-processing demands will be rewarded in the market for executive labor because the ability to cope with large volumes of diverse information is likely to be both rare and critical to organizational performance, and because such demands provide a convenient benchmark for appraising the magnitude of CEOs' contributions.

THEORY DEVELOPMENT

Processes Linking Information-Processing Demands and CEO Compensation

There are several reasons for expecting that CEOs will be paid in accordance with the information-processing demands they face. First, information-processing tasks are a major part of CEOs' jobs, and the execution of such tasks is critical to organizational functioning and performance (Eisenhardt, 1989a; Galbraith, 1973; Halebian & Finkelstein, 1993; Mintzberg, 1973; Prahalad & Bettis, 1986; Thompson, 1967). Thus, CEOs play a critical role as information processors.

Second, CEOs' jobs vary considerably in the information-processing demands they create. For instance, as firms become more diversified, the volume of information that a CEO must process tends to rise (Chandler, 1962; Finkelstein & Hambrick, 1989; Prahalad & Bettis, 1986). Furthermore, the ability to cope with high information-processing demands is likely to be rare (Agarwal, 1981; Finkelstein & Hambrick, 1989), in part because most executives lack the skills needed to cope with the volume and diversity of information associated with widely varying contingencies (Govindarajan, 1989; Gupta, 1988; Gupta & Govindarajan, 1984). Therefore, if having a CEO who can process the information needed to cope with multiple contingencies is seen as being critical to firms' performance (Andrews, 1987; Mintzberg, 1973; Quinn, 1980), then those firms with high information-processing demands will tend to pay their CEOs more in an effort to attract capable candidates (Pfeffer & Davis-Blake, 1987).

The above portrayal paints a relatively rational picture of executive labor markets—CEOs facing high information-processing demands are paid more because their ability to meet this challenge allows them to make larger marginal contributions to firm performance. However, CEOs may also be paid

in relation to information-processing demands simply because it is easier to assess such demands than to evaluate an executive's marginal contribution in a given job. As Finkelstein and Hambrick (1988) noted, boards of directors often find it extremely difficult to evaluate CEOs' marginal contributions. Lacking a clear-cut way to assess such contributions, boards may instead rely on proxies (Finkelstein & Hambrick, 1988). Therefore, if boards can assess the information-processing demands that CEOs face more readily than their performance, and if boards also feel that the ability to process large quantities of varied information is a rare skill, then information-processing demands themselves may become an important yardstick for valuing CEOs' contributions.

It is important to note that the extent to which information-processing demands are implicitly or explicitly considered in setting CEO compensation is an open question—and a question that was not investigated in this study. Our reading of corporate proxy statements suggests that some boards of directors do explicitly consider such demands when setting CEO pay. However, those demands may be considered much less deliberately in other firms. Therefore, our intent was to test whether CEOs are paid in accordance with information-processing demands, not to examine whether and how boards consider such demands in setting pay. In addition, it should be emphasized that our arguments linking information-processing demands and CEO compensation are descriptive rather than prescriptive. As indicated in the Discussion section, paying CEOs in accordance with such demands may ultimately have negative as well as positive effects on firm performance.

Assessment of Information-Processing Demands

As noted above, we considered how the number and interdependence of a firm's business activities, the technology it employs, and the management structure used to administer it affect the information-processing demands placed upon its CEO. More specifically, we investigated the relationship between CEO compensation and three firm-level variables that reflect such information-processing demands: (1) a firm's diversification strategy, (2) its approach to R&D and capital investment activities, and (3) the size of its top management team. These firm-level variables were selected for three reasons. First, they have important strategic implications for an entire firm that are particularly likely to affect the information-processing activities of the chief executive (Chandler, 1962; Kotter, 1982; Thompson, 1967). Second, theory (Galbraith, 1973; Thompson, 1967), case histories (Chandler, 1962), and direct observation of top executives (Kotter, 1982; Mintzberg, 1973) all suggest that these variables have relatively unambiguous effects on the information-processing demands that confront CEOs. Third, by focusing on these firm-level variables, we were able to assess those demands using archival data.

The above point—that certain firm-level variables are valid indicators of the information-processing demands that CEOs encounter—is particularly important and is well supported by prior research. For instance, theoretic-

cal arguments (Galbraith, 1973; Hill & Hoskisson, 1987; Jones & Hill, 1988; Thompson, 1967) and direct observation of top executives (Kotter, 1982; Mintzberg, 1973) both indicate that the level of information-processing demands a CEO faces can be inferred from the firm-level context in which he or she operates. For example, from direct observation, Kotter concluded that

Although significant differences in job demands were created by differences in the type of GM job involved [multidivisional CEO, autonomous division GM, etc.], even more and larger variations resulted from differences in the business and corporate contexts. These dimensions [on which context varied] include such things as: . . . the rate of technological change; the level of profitability or loss . . . the diversity of products and markets; the sheer number of products and yearly volume . . . the way the overall firm is structured . . . [and] the degree to which businesses and functions are interdependent (1982: 27).

Consequently, prior research strongly indicates that the independent variables considered here—diversification strategy, approach to R&D and capital investment activities, and top management team size—are valid indicators of the information-processing demands that CEOs face (Galbraith, 1973; Hill & Hoskisson, 1987; Jones & Hill, 1988; Kotter, 1982; Thompson, 1967). In turn, each of these variables can be readily assessed using archival data (e.g., Bettis, 1981; Lubatkin, Merchant, & Srinivasan, 1993). Therefore, rather than relying on a technique such as direct observation to assess information-processing demands, we assessed those demands by examining archival data that relate to those independent variables. To be sure, using archival data rather than direct observation to assess CEOs' information-processing demands has limitations (see Discussion); however, this approach allowed us to gather objective measures for a large number of firms over a considerable period of time. The following section advances specific hypotheses regarding the links between information-processing demands and CEO compensation.

Hypothesis Development

Diversification and information processing. A firm's diversification strategy is likely to have profound effects on the information-processing demands faced by its CEO (Chandler, 1962). In particular, the number of businesses managed seems likely to contribute to those demands (Kotter, 1982). Thompson (1967) suggested that the more businesses an executive must manage, the broader the range and complexity of the nonroutine, strategic decisions that he or she must make. And, as the range and diversity of decision tasks increases, so does the amount of information that must be processed (Campbell, 1988; Schroder, Driver, & Streufert, 1967). Moreover, the number of businesses managed has important implications no matter if they are related or unrelated. In related-diversified firms, an increase in the number of businesses adds to information-processing demands by increasing business-unit interdependencies (Hill & Hoskisson, 1987; Jones & Hill, 1988; Kerr, 1985; Michel & Hambrick, 1992; Pitts & Hopkins, 1982). In

unrelated-diversifiers, as the number of businesses increases, the information-processing requirements associated with maintaining efficient internal capital markets also increase (Jones & Hill, 1988). Given our earlier arguments linking information-processing demands and CEO pay, this discussion suggests

Hypothesis 1a: There will be a positive relationship between the number of businesses managed and CEO compensation.

In addition to the main effect of the number of businesses, research indicates that the number of businesses managed and the relatedness of those businesses will jointly contribute to information-processing demands. More specifically, because conglomerates and related-diversifiers use fundamentally different management control systems (Baysinger & Hoskisson, 1990; Pitts, 1977), increases in the number of businesses managed may have quite different effects on CEOs' information-processing demands in firms pursuing related, as opposed to unrelated, diversification.

Regarding the joint effects of relatedness and the number of businesses managed, simple counts of businesses may overstate the informational demands executives face in related diversifiers. Several authors have suggested that related diversifiers create value by reapplying core skills and competencies across multiple businesses (Galbraith & Kazanjian, 1986; Prahalad & Hamel, 1990; Rumelt, 1974). Similarly, Prahalad and Bettis stated that the demands "of the top management process [are] a function of the strategic variety, not just the number of distinct businesses" (1986: 490). Moreover, research on task complexity indicates that repeated use of a single body of knowledge or skills tends to reduce information-processing loads (Campbell, 1988; Wood, 1986). Therefore, using the same core skills across multiple businesses may limit the information-processing demands that confront CEOs in related diversifiers.

In contrast, top executives in conglomerates focus primarily on managing internal capital markets (Williamson, 1975). In those internal markets, the uniqueness and autonomy of each business contributes independently to the magnitude and complexity of the monitoring and financial control tasks that executives face (Baysinger & Hoskisson, 1990; Kerr, 1985; Pitts, 1977). Therefore, in a conglomerate, information-processing demands are very much a function of the number of businesses managed (Jones & Hill, 1988). For example, Levy (1985) drew on the arguments of Williamson (1975) and Coase (1937) in stating that administrative costs "are expected to increase more with the addition of nonrelated activities than with related activities for two reasons: new information processing capabilities must be incorporated into the firm's organizational network and the evaluation of performance requires the adoption of new standards" (Levy, 1985: 440).

The above arguments indicate that the number of businesses managed will have a larger effect on information-processing demands in conglomerates than in related diversifiers. Given the expected relationship between such demands and CEO compensation:

Hypothesis 1b: The interaction of the number of businesses managed and a conglomerate diversification strategy will have a positive relationship with CEO compensation.

The above arguments suggest that each additional business in a conglomerate will place more information-processing demands on the CEO than will each new business in a related diversifier. However, evidence also suggests that if the number of businesses is controlled, the CEOs of related diversifiers will experience greater information-processing demands than will the top executives of conglomerates. In unrelated diversifiers, top executives focus largely on gaining financial economies among relatively autonomous divisions, and they typically limit their role in operational matters to approving or denying business-unit investment requests (Jones & Hill, 1988; Lorsch & Allen, 1973; Michel & Hambrick, 1992; Song, 1982). Such executives also tend to rely on standardized financial control systems that are applied in a similar fashion regardless of the type of business being managed (Baysinger & Hoskisson, 1990; Hayes & Abernathy, 1980). As a result, top executives in conglomerates rely heavily on objective, ex post financial information to make decisions, and their organizations tend to be "managed by the numbers" (Kerr, 1985).

In contrast, top executives in related diversifiers often take an active role in coordinating and integrating business-unit interdependencies and resource exchanges (Michel & Hambrick, 1992; Pitts & Hopkins, 1982; Rumelt, 1974). Moreover, they typically apply a variety of qualitative criteria to evaluate the decisions of SBU-level managers (Baysinger & Hoskisson, 1990; Kerr, 1985; Pitts, 1977), and this requires them to have considerable knowledge of SBU activities. So, rather than allowing standardized financial analyses to dominate their resource allocation decisions, CEOs in related diversifiers must have an in-depth understanding of their firms' strategic capabilities in order to make informed resource-sharing decisions that create true economies of scale and scope.

The above comparison suggests that CEOs in related diversifiers are called on to evaluate data that are more subjective and more varied and that must be more highly integrated than the data CEOs in conglomerates need to evaluate. In turn, each of these factors increases information-processing demands (Campbell, 1988; Schroder et al., 1967; Wood, 1986). Thus,

Hypothesis 1c: Firms pursuing conglomerate diversification will have lower levels of CEO compensation than firms pursuing related-diversification strategies.

Top management team size and information processing. Prior work (e.g., Chandler, 1962; Williamson, 1975) indicates that a number of administrative mechanisms, such as a large top management team (TMT), can be used to reduce the information-processing load that confronts a firm's top executive. Given our earlier arguments linking information-processing demands and CEO pay, this suggests that TMT size may be related to CEO compensation. Thompson (1967), for example, addressed how TMT size

could affect information-processing demands. He noted that the range and complexity of decisions confronting the CEO in a diversified firm frequently exceeds his or her comprehension. To counter this tendency, the size of the dominant coalition (that is, the top management team) is often increased, thus reducing the number of decisions that must be made and monitored by the CEO. Therefore, an increase in the size of a TMT is likely to decrease the information-processing demands confronting a CEO (Chandler, 1962; Halebian & Finkelstein, 1993; Thompson, 1967). Given the link between information-processing demands and CEO pay, these arguments suggest

Hypothesis 2a: There will be a negative relationship between top management team size and CEO compensation.

In addition to the main effect of TMT size on CEO compensation, it can be argued that there will be an interaction between the former and a firm's diversification strategy. In particular, TMT size seems likely to have quite different effects on information-processing demands in conglomerates and related diversifiers. As noted earlier, conglomerates seek economies through the efficient operation of internal capital markets (Baysinger & Hoskisson, 1990; Williamson, 1975). To achieve such economies, they typically place a high premium on reducing overhead, and the number of corporate-level personnel (e.g., TMT members) is kept to an absolute minimum (Pitts, 1977). Therefore, TMT members in conglomerates generally devote the majority of their time and energy to overseeing the day-to-day operation of their firm's autonomous business units (Pitts, 1977). So, regardless of the size of his or her top team, it appears that a CEO in a conglomerate must personally shoulder a substantial part of the information-processing demands associated with achieving financial synergies.

In contrast, it was noted earlier that the primary task of the chief executive in related diversifiers is to achieve synergies through resource exchanges among business units (Hill, Hitt, & Hoskisson, 1992; Hill & Hoskisson, 1987; Hoskisson & Johnson, 1992). However, managing such synergies is a task that is typically shared among TMT members (Chandler, 1962; Williamson, 1975). These differences in the roles of top management teams suggest that although CEOs in conglomerates will not be able to routinely "download" their top priority management tasks (i.e., creating financial synergies), those in related diversifiers will often be directly assisted by TMT members in performing their most critical duties (i.e., coordinating resource sharing among interdependent business units). Therefore, a TMT of any given size should reduce the information-processing demands confronting a CEO less dramatically in conglomerates than in related diversifiers. Thus,

Hypothesis 2b: The interaction of top management team size and a conglomerate diversification strategy will have a positive association with CEO compensation.

Technology and information processing. An organization's approach to technology can also affect the information-processing demands confronting its top executives (Thompson, 1967). For example, high levels of capital

investing typically indicate considerable vertical integration and sharing of production technology (Chatterjee & Wernerfelt, 1991; Harrigan, 1984). In turn, vertical integration requires executives to devote considerable time and attention to coordinating the operating interdependencies associated with long-linked chains of activities (Fry, 1982; Michel & Hambrick, 1992; Thompson, 1967). As the number of sequential dependencies among various activities increases (which is the case in a long-linked chain of activities), the knowledge and skill required to coordinate them also increases (Wood, 1986). And, as knowledge and skill requirements increase, information-processing demands also rise (Campbell, 1988; Locke et al., 1981). Thus,

Hypothesis 3: Capital investment activity will be positively related to CEO compensation.

High levels of R&D activity are also likely to result in high levels of information-processing demands. Increased R&D activity is typically associated with higher levels of technological uncertainty, more sophisticated and differentiated products, more specialized personnel, and higher levels of intrafirm technology pooling (Kamien & Schwartz, 1982; Levy, 1985; Michel & Hambrick, 1992). Thus, high levels of R&D activity seem likely to contribute to information-processing demands because: (1) the uncertainty created by changing technologies complicates the tasks of planning and coordinating subunit interdependencies (Thompson, 1967), (2) the differentiated products and personnel associated with high levels of R&D increase the difficulty of integrating subunit activities (Lawrence & Lorsch, 1967), and (3) technology pooling across businesses requires executives to intervene in interunit transactions (Michel & Hambrick, 1992; Pitts & Hopkins, 1982). Overall, a high level of R&D activity results in high uncertainty, high coordination requirements, and a great variety of task inputs, all of which increase information-processing demands (Campbell, 1988; Schroder et al., 1967). This argument suggests that if CEOs are indeed paid to process information, then CEO pay will be positively related to R&D activity. However, other theoretical arguments suggest that R&D-based information-processing demands will be reflected only in certain components of CEO pay.

CEO pay is often viewed as consisting of (1) *cash compensation* and (2) *long-term compensation*, in the form of stock options, performance plans, restricted stock, and other long-term incentive plans (Lambert, Larcker, & Weigelt, 1993; Murphy, 1985). In turn, *total compensation* equals the sum of cash and long-term pay. Agency theory suggests that the mix of cash and long-term compensation is influenced by the time horizon of investment payoffs and the degree to which agents perform tasks that can be readily monitored (Eisenhardt, 1989b; Galbraith & Merrill, 1991; Gomez-Mejia, 1992). Because R&D activities typically involve long-term payoffs and uncertain outcomes and are particularly difficult for investors to monitor, owners have an incentive to compensate executives who oversee such activities with long-term pay rather than cash (Arrow, 1962; Galbraith & Merrill, 1991). In combination, these arguments suggest two outcomes. First, CEOs in

firms with high levels of R&D activity will have jobs with high information-processing demands; thus, they will be paid more in total compensation. Second, given the uncertainty associated with R&D activities, this additional compensation will tend to be granted in the form of long-term pay, rather than in cash. Thus,

Hypothesis 4a: R&D activity will be positively related to long-term CEO compensation.

Hypothesis 4b: R&D activity will be positively related to total CEO compensation.

Hypothesis 4c: R&D activity will be unrelated to CEOs' cash compensation.

It should be noted that unlike Hypotheses 4a–4c, Hypotheses 1a–3 involve relationships between information-processing demands and CEO compensation in general, without regard to the form in which such compensation is paid. In other words, our intent in Hypotheses 1a through 3 was to identify relationships that hold for cash and long-term compensation as well as for total compensation. Therefore, we conducted separate empirical analyses of Hypotheses 1a–3 using measures of cash, long-term, and total pay. In contrast, Hypotheses 4a–4c were all tested on a single form of CEO compensation.

METHODS

Sample

Data were collected on CEOs and firms in four industry groups—chemicals, high-tech equipment, natural resources, and conglomerates. Four industries were used because there is evidence that CEO compensation varies systematically across industry groups (O'Reilly et al., 1988), and using several such groups allowed us to (1) assess hypothesized differences between conglomerates and related diversifiers and (2) assess whether the effects of related diversification were consistent across industries. As shown in Table 1, the four industry groups we selected vary widely in their product-market diversity, capital investment activity, R&D activity, and top management team size. Selecting groups that vary widely on the independent variables increased our confidence that the results obtained here can be generalized.

The first three industry groups were developed from firms listed in *Fortune's* annual survey of industrial corporations. We identified these groups as (1) chemicals, which was formed directly from *Fortune's* chemicals group, (2) high-tech equipment, which was composed of *Fortune's* office equipment and computer group, plus its scientific and photographic equipment group, and (3) natural resources, which was composed of the petroleum refining and the mining and crude oil production groups. All firms listed under these headings were included.

Because several of our hypotheses refer to differences between firms pursuing related and conglomerate diversification, it was also necessary to

TABLE 1
Means and Standard Deviations of Selected Variables by Industry Group^a

Variable	Chemicals	High-Tech Equipment	Natural Resources	Conglomerate
Cash compensation	918,000 (416,000)	873,000 (448,000)	893,000 (432,000)	1,229,000 (737,000)
Long-term compensation	505,000 (501,000)	703,000 (964,000)	577,000 (737,000)	920,000 (1,292,000)
Number of businesses	10.36 (8.68)	5.42 (4.44)	6.49 (4.22)	16.25 (10.51)
TMT size	16.64 (9.90)	21.40 (14.79)	17.94 (9.33)	20.31 (13.55)
Capital investment activity	0.083 (0.042)	0.085 (0.044)	0.111 (0.095)	0.072 (0.106)
R&D activity	0.032 (0.022)	0.076 (0.036)	0.003 (0.004)	0.022 (0.019)
ROA	0.080 (0.075)	0.068 (0.080)	0.035 (0.060)	0.054 (0.044)
Sales ^b	5,177 (7,632)	6,092 (11,636)	15,063 (22,335)	8,314 (9,982)
Number of firms in industry group for year				
1985	18	26	27	16
1990	26	29	26	21

^a $N = 189$; standard deviations shown in parentheses.

^b In millions of dollars.

identify a set of conglomerate firms. *Fortune* does not identify a conglomerate group, but the *Business Week* and *Forbes* annual surveys of corporations do. Therefore, we used these latter two publications to identify a group of conglomerate firms. This approach to identifying conglomerates has been used previously by Williams, Paez, and Sanders (1988).

We collected data on all variables from two different years (1985 and 1990) and then pooled observations across years. This approach resulted in a sample with 189 firm-years of observations (chemicals = 44 observations, high-tech equipment = 55, natural resources = 53, and conglomerates = 37). Because some firms moved in and out of the various lists and industry groups from one year to the next, the sample includes 29 firms that appeared in 1985 only, 44 that appeared in 1990 only, and 58 that appeared in both years. Hence, the total sample size is derived as follows: $29 + 44 + (2 \times 58) = 189$. To control for inflation and any other exogenous, time-related differences in pay, we coded year as a dummy variable (1985 = 0, 1990 = 1).

Measures

Dependent variables. Analyses were conducted with three different dependent variables: (1) cash compensation, (2) long-term compensation, and (3) total compensation. Required data were collected from annual proxy

statements. Here, *cash compensation* includes all remuneration in the form of salary and bonus. *Long-term compensation* equals the value of all long-term, contingent pay in the form of stock options, performance unit or share plans, restricted stock, and long-term management incentive plans. *Total compensation* represents the sum of cash and long-term compensation. In the reported analyses, the natural logarithms of cash, long-term, and total compensation were used to reduce heteroscedasticity.

It should be noted that long-term compensation was valued using the formula outlined by Lambert, Larcker, and Weigelt (1993). Per that formula, stock options were valued at 25 percent of their exercise price, which produces values in the same range as more sophisticated option-pricing methods such as the Black-Scholes model (Lambert, Larcker, & Verrecchia, 1991; Lambert et al., 1993). To insure the robustness of our results, we followed the advice of Lambert and colleagues and also valued stock options at 50 percent of their exercise price. This alternative valuation method produced results no different from those reported below. Again following Lambert and colleagues' (1993) formula, we valued grants associated with performance plans by multiplying the number of performance units or performance shares either by their respective target values (when stated prospectively) or by the actual payout per unit or share (if stated retrospectively). Finally, we valued restricted stock grants by multiplying the number of restricted shares granted by the price per share on the date of grant.

It should be emphasized that valuing long-term compensation is not as straightforward a process as valuing cash compensation. In particular, the amount of pay an individual will ultimately receive under a long-term pay plan is uncertain at the time such compensation is awarded, and there is little consensus among researchers regarding how to value such grants (see Lambert et al. [1993] for a discussion). For example, the ultimate proceeds from a stock option grant depend on the future performance of the firm's stock, whether the CEO remains with the firm, and the CEO's risk preferences. Therefore, like the results of any study that includes long-term pay, the results reported here reflect the assumptions used to value that pay.

Independent variables. We determined *number of businesses* for each firm by counting the number of four-digit Standard Industrial Classification (SIC) codes reported in *Standard & Poor's Register of Corporations, Directors and Executives*. Lubatkin and colleagues (1993) examined a variety of diversification measures and concluded that for researchers who wished to study the primary effect of diversification, a simple count of businesses was as valid as more complex measures.

TMT size was a count of the number of corporate officers in each firm. These data were obtained from *Standard & Poor's Million Dollar Directory*.

The *conglomerate* dummy variable was coded 1 for firms pursuing conglomerate diversification and 0 for firms pursuing related patterns of diversification (Bettis, 1981). It is important to note that research on diversification (e.g., Hoskisson, Hitt, Johnson, & Moesel, 1993; Montgomery, 1982; Rumelt, 1974) has typically used multicategorical or continuous measures that assess

product relatedness. However, we did not use one of those measures because the aspect of diversification considered here is quite different from that considered in such prior research. Rather than examining product relatedness, our intent was to capture qualitative differences in the managerial challenges and control systems found in conglomerates and nonconglomerates. As noted earlier, conglomerates typically employ arm's-length financial control systems and run their businesses by the numbers. Therefore, their executives have little or no involvement in business-unit activities (Baysinger & Hoskisson, 1990; Kerr, 1985; Pitts, 1977). In contrast, most related diversifiers, regardless of the degree to which their businesses are related, tend to use "strategic" control systems (Baysinger & Hoskisson, 1990: 78) that require executives to have in-depth knowledge of business-level operating issues. It is this qualitative distinction that we were trying to capture in our coding scheme.

Data on *R&D activity* (annual R&D expenditures divided by sales) and *capital investment activity* (annual capital equipment expenditures divided by sales) were obtained from COMPUSTAT. Although our measure of capital investment activity is similar to measures of capital intensity used elsewhere (net value of plant and equipment divided by number of employees is a typical example), it has an important difference. Namely, our activity-based measure better captures the magnitude of consequential, nonroutine decisions made by a top executive in the recent past, rather than the accumulation of such decisions over a longer period of time. Some firms may exhibit high capital intensity but have relatively low investments in recent years. In such a case, information-processing tasks may have become highly routinized and may now be performed at lower levels of the hierarchy. In contrast, new investments in plant and equipment are more likely to require information-processing efforts that fall within the purview of top-level management.

Control variables. Prior studies (e.g., Ciscel & Carroll, 1980; O'Reilly et al., 1988) have shown CEO compensation to be highly correlated with *firm size*; therefore, a measure of size (the natural logarithm of firm sales) was entered as a control. We obtained sales data from COMPUSTAT and used a gross-national-product-based deflator to insure comparability across years.

In contrast to the consistent empirical results on the effects of size, empirical findings about the relationship between CEO pay and firm performance have been equivocal; some studies have shown a mildly positive relationship (e.g., Ciscel & Carroll, 1980; Finkelstein & Hambrick, 1989), and others have failed to find any significant association (e.g., Kerr & Bettis, 1987; O'Reilly et al., 1988). To account for any potential links between CEO pay and firm performance, we used several measures, with prior-year *return on assets (ROA)* as the primary control. Although ROA is highly correlated with return on equity (ROE), it is less sensitive to a firm's capital structure. In addition, several alternative measures (e.g., three-year average, year-to-year change) of ROA, ROE, and stock price were also used. We obtained data for all of the performance measures from COMPUSTAT.

Chief executive compensation has also been shown to be related to tenure (Finkelstein & Hambrick, 1989; Hill & Phan, 1991); therefore, we included the logarithm of *CEO tenure* (number of years as CEO) as a control variable. The log of CEO tenure was used because it has been suggested that CEO compensation is directly related to the power a chief executive wields relative to a board (Finkelstein & Hambrick, 1988) and that such power reaches an upper limit over time. For example, the power accruing to long-tenured CEOs vis-à-vis their boards of directors tends to peak when the former have been in office long enough to influence the selection of most or all of the boards' members (Fredrickson, Hambrick, & Baumrin, 1988).

It can be argued that the number of years an executive worked in a firm prior to becoming CEO taps another important phenomenon. For example, long company tenure prior to becoming CEO may indicate that a particular executive needed a long exposure to the board before capturing its trust and building a coalition that would support his or her ascendancy to the top job. Similarly, it might indicate that a future CEO was held back while one or more particularly capable executives occupied the top office. Therefore, executives who require long seasoning may be viewed by boards as being competent custodians of the office, but they would probably lack the ringing endorsement given to executives who became CEOs more quickly. Thus, one might expect that executives with longer company tenure prior to assuming the top job would be paid less. From a somewhat different perspective, an individual's relatively short company tenure prior to becoming CEO (say, one to two years) may indicate that the person was really an outside successor, one whose ultimate compensation as CEO was higher because it was recently subject to external market forces. To allow for these possibilities, we entered the *years-before-CEO* variable, measured as company tenure minus CEO tenure, as a control. Data on company tenure and CEO tenure, in years, were obtained from *Forbes*.

Founder status was the final control variable. CEOs who were company founders were expected to draw lower salaries because they typically have significant ownership positions in their firms and therefore expect to prosper primarily through increases in stock price. In addition, founders may draw lower salaries because their doing so sends a powerful symbolic message to corporate stakeholders—that founders are not putting their self-interests first. Although the potential relationship between foundership and compensation is interesting in and of itself, in this study, the founder dummy variable was included only as a control.

RESULTS

Table 2 provides the means, standard deviations, and correlations of the independent and dependent variables. Cash compensation for the CEOs in the sample averaged \$957,000 per year (s.d. = 529,000),¹ and it ranged from

¹ The natural logarithm of CEO compensation is shown in Table 2 and was used in all statistical analyses. However, to ease interpretation, we list "nonlogged" numbers in Table 1 and wherever compensation figures are referenced in the text.

TABLE 2
Means, Standard Deviations, and Correlations of All Variables^a

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Cash compensation ^b	13.64	0.52													
2. Long-term compensation ^b	11.13	4.70	.45												
3. Total compensation ^b	14.06	0.69	.87	.66											
4. Conglomerate	0.19	0.40	.21	-.04	.18										
5. R&D activity	0.04	0.04	-.08	.13	-.01	-.18									
6. Capital investment activity	0.09	0.08	-.05	.11	.01	-.12	-.01								
7. Number of businesses	8.96	8.06	.29	.13	.25	.44	-.07	-.18							
8. TMT size	19.11	12.17	.06	-.02	.02	.05	.19	-.02	.15						
9. Founder status	0.08	0.27	-.16	-.22	-.13	-.09	.29	.02	-.18	.08					
10. Years before CEO	16.92	11.96	.04	.08	.05	-.03	-.22	-.38	.21	.17	-.38				
11. CEO tenure ^b	1.97	0.79	.06	-.28	-.05	.11	.12	-.09	.05	.06	.39	-.33			
12. Sales ^b	7.38	1.45	.22	.04	.19	.08	-.10	-.15	.25	.51	-.05	.32	-.08		
13. ROA	0.06	0.07	-.00	-.04	-.06	-.03	.12	.03	-.01	-.02	.12	-.05	.17	-.00	
14. Year	0.54	0.50	.39	.26	.41	.03	-.01	.05	-.02	-.33	-.02	-.07	-.02	-.55	.03

^a $N = 189$; $p < .05$ for all $r > .14$; $p < .01$ for all $r > .18$.

^b Natural logarithms are used.

a low of \$100,000 for Warren Buffet of Berkshire Hathaway to the \$4.06 million paid to Rand Araskog of ITT. Long-term compensation averaged an additional \$664,000 per year (*s.d.* = 902,000) and ranged from \$0 to the \$7.00 million paid to Mr. Araskog in 1990.

Regression Model Construction

The indicators of information-processing demands—number of businesses, capital investment activity, and so on—were not expected to covary substantially within firms. For instance, some firms may emphasize capital investment activity to achieve production efficiencies, and others may invest heavily in R&D to encourage new-product innovation (Miles & Snow, 1978). Table 2 bears out this expectation: correlations among the independent variables were generally modest. Therefore, rather than trying to aggregate the various indicators into a single assessment of information-processing demands, we considered each as a separate variable and tested the hypotheses through a series of multiple regressions. To further assess this approach, we conducted a confirmatory factor analysis on the five independent variables. This analysis yielded a five-factor solution in which (1) each independent variable loaded heavily on one factor ($r > .95$ in all cases), but (2) no variables loaded heavily on the same factor. This result reinforces the idea that the independent variables are empirically distinct.

Table 3 contains regression models predicting the logarithms of cash, long-term, and total compensation. For each of these forms of CEO pay, model 1 indicates the amount of variance explained by the control variables, and model 2 adds all predictor variables associated with the hypotheses. Diagnostic analyses of the long-term and total compensation models indicated there was a high degree of multicollinearity between the number-of-businesses main effect and the conglomerate-by-number-of-businesses interaction. Therefore, in both model 3 for long-term pay and model 3 for total pay, the nonsignificant conglomerate-by-number-of-business interaction was dropped. In both cases, R^2 did not decrease when those interactions were dropped, so these models will be used to interpret results. Since all the hypotheses (except 4c) involve directional predictions, one-tailed tests are reported throughout the following discussion. (Hypothesis 4c, which predicts a null relationship between R&D activity and cash compensation, was evaluated using a two-tailed test.) To further aid the reader, Table 4 summarizes our findings across the three different forms of CEO compensation. A blank cell in that table indicates that the hypothesized relationship was not supported.

The following section reports results of the hypothesis tests. Results associated with hypothesized main effects are reported first, followed by results for the hypothesized interactions. Results pertaining to control variables are reported last.

Hypothesis Tests

Main effects. Hypothesis 1a predicts a positive relationship between the number of businesses managed and CEO compensation. As Table 3 shows,

TABLE 3
Results of Multiple Regression Models Predicting Logarithms of Cash, Long-Term, and Total Compensation^a

Predictor	Predicted Sign	Cash			Long-Term			Total		
		Model 1	Model 2		Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Number of businesses	+		0.012*			0.082	0.090*		0.010	0.010*
Conglomerate	-		-0.301*			-0.850	-1.010		-0.184	-0.174
TMT size	-		0.009			-0.027	-0.029		0.006	0.006
R&D activity	+ ^c		0.223			29.861***	29.823***		2.051*	2.053*
Capital investment activity	+		0.630*			9.669*	9.729*		1.250**	1.246**
Conglomerate × number of businesses	+		0.008			-0.015			0.001	
Conglomerate × TMT size	+		0.014**			0.002	0.001		0.015*	0.015*
Founder status	-	-0.421***	-0.376**	-2.621*		-3.471**	-3.504**	-0.368*	-0.340*	-0.338*
Years before CEO	-	-0.007**	-0.008**	-0.049*		-0.056*	-0.056*	-0.010**	-0.010**	-0.100**
CEO tenure ^b		0.083*	0.085*	-1.462**		-1.384**	-1.373**	-0.000	0.001	0.000
Sales ^b		0.249***	0.256***	0.933**		1.118***	1.123***	0.309***	0.334***	0.334***
ROA		0.003	0.002	0.020		0.000	-0.001	-0.001	-0.002	-0.002
Year		0.791***	0.793***	3.764***		3.822***	3.830***	1.042***	1.039***	1.038***
R ²		0.490***	0.536***	0.206***		0.292***	0.292***	0.438***	0.491***	0.491***
Δ R ² from model 1			0.046*			0.086**	0.086**		0.053**	0.053**

^a N = 189; nonstandardized regression coefficients are shown.

^b Logarithms are used.

^c R&D activity was predicted to have a positive relationship with long-term and total pay and a null relationship with cash-based pay.

*p < .05, one-tailed test

**p < .01, one-tailed test

***p < .001, one-tailed test

TABLE 4
Summary of Results for Hypotheses Involving Cash, Long-Term, and Total Compensation^a

Predictor	Predicted Sign	Dependent Variable		
		Cash Compensation	Long-Term Compensation	Total Compensation
Number of businesses	+	Supported	Supported	Supported
Conglomerate	—	Supported		
TMT size	—			
R&D activity	+	Supported	Supported	Supported
Capital investment activity	+	Supported	Supported	Supported
Conglomerate × number of businesses	+			
Conglomerate × TMT size	+	Supported		Supported

^a A blank cell indicates that the hypothesized relationship was not supported.

^b R&D activity was predicted to have a positive relationship with long-term and total pay and a null relationship with cash-based pay.

model 2 for cash compensation and model 3 for both long-term and total pay reveal that this relationship was indeed significant and in the predicted direction for all three forms of CEO compensation. Hypothesis 1c predicts that the CEOs of conglomerates will be paid less than their counterparts in related diversifiers. This relationship was significant and in the predicted direction for cash compensation. For long-term and total compensation, it was in the predicted direction but was not significant. Table 3 also indicates that Hypothesis 2a, which predicts a negative relationship between TMT size and CEO compensation, was not supported for any of the three forms of CEO pay.

With respect to technology effects, Hypothesis 3 states that capital investment activity will have a positive relationship with CEO compensation. As Table 3 indicates, this relationship was indeed significant and in the predicted direction for all three forms of CEO pay. Moreover, R&D activity was positively and significantly related to both long-term and total pay, thus supporting Hypotheses 4a and 4b. And, as predicted in Hypothesis 4c, R&D activity was unrelated to cash compensation ($p > .78$, two-tailed test).

Interaction effects. In addition to hypothesizing several main effects, we also argued for the presence of two interactions. The several model 2s in Table 3 reveal that the conglomerate-by-number-of-businesses interaction advanced in Hypothesis 1b was not significant for any of the forms of CEO pay. Regarding the effects of the conglomerate-by-TMT-size interaction, model 2 for cash compensation and model 3 for total compensation indicate that this interaction, as predicted in Hypothesis 2b, was significant and positively related to both of these forms of pay. However, this interaction was not significant for long-term compensation. As noted earlier, the main

effect of TMT size was *not* related to CEO pay. That finding, coupled with the significance of the conglomerate-by-TMT-size interaction reported here, suggests that TMT size has a positive relationship with cash and total compensation, but only in conglomerate diversifiers.

Robustness of results. To determine if the results were robust, we performed several additional analyses. As mentioned above, our sample contained 131 firms, 58 of which contributed observations for both 1985 and 1990. Observations from the same firm are not fully independent of one another, a condition that can create autocorrelation effects. In turn, severe autocorrelation can lead to underestimates of the standard errors of regression coefficients, resulting in inflated *t*-statistics for those coefficients. Durbin-Watson tests are often used to determine whether there is significant autocorrelation in a sample. However, owing to the nature of our sample, we did not employ such tests. Durbin-Watson tests are most applicable in panel or time-series designs in which all observations are repeated one or more times; in our sample, there were 63 cases in which a firm was observed in only one year. Consequently, the sample contained 63 observations that might not reveal autocorrelation using the Durbin-Watson statistic. Therefore, we assessed autocorrelation using the technique described by Davis-Blake and Uzzi (1993: 213), which is actually more conservative than approaches that rely on Durbin-Watson tests.

Following Davis-Blake and Uzzi (1993), we estimated models on subsamples that contained only one observation per firm. Each subsample included all observations from firms that were observed in only one year ($n = 73$), plus exactly one observation, randomly selected, from each firm that contributed data in both 1985 and 1990 ($n = 58$). We reestimated each model four times (using model 2 for cash compensation, model 3 for long-term pay, and model 3 for total pay), using different sets of randomly selected observations from the two-observation firms. Thus, for each reestimation of a model there were 131 observations ($73 + 58$), but the membership of this subsample varied because of the random selection process. The results of these analyses were essentially identical to those reported in Table 3, and they clearly suggest that autocorrelation did not threaten the statistical validity of the study.

As was also noted earlier, we found three instances in which either the conglomerate main effect (for cash) or the conglomerate-by-TMT-size interaction (for cash and total pay) was significant. Such findings raise the question of whether these contrasts held across the entire sample of related-business firms or were limited to the related diversifiers in a particular industry group. In supplementary analyses not shown here, the conglomerate group was used as the omitted category, and dummy variables were created for the chemicals, high-tech equipment, and natural resources industry groups. We entered each dummy variable both as a main effect and in interaction with TMT size and then conducted regressions corresponding to model 2 for cash and model 3 for long-term pay. In those models, cash compensation was significantly higher in each of the three related-diversifier categories

than it was in conglomerates (a finding consistent with Hypothesis 1c). Similarly, the industry group-by-TMT-size interaction was negative and significant for both cash and total compensation for each of the related-diversifier categories (which is consistent with Hypothesis 2b). Thus, the reported contrasts between conglomerates and related diversifiers were robust across each of the related industry groups.

Control Variable Results

As indicated in model 1 for each of the three forms of pay, essentially all of the controls (except ROA) were significant. The one exception was that CEO tenure was not associated with total compensation. Consistent with prior research, cash compensation increased significantly with tenure ($p < .05$). But somewhat surprisingly, tenure was negatively related to long-term compensation ($p < .01$), and it was not significantly associated with total pay. These latter two relationships may be explained by Hill and Phan's (1991) findings, which indicate that CEOs' influence over the form in which they are paid increases with tenure. If we assume that CEOs prefer to be paid in cash rather than in long-term, contingent form, we would expect that long-term pay, as a percentage of total pay, would drop with increasing tenure. Indeed, since CEO tenure was unrelated to total compensation, this suggests that the overall magnitude of CEOs' pay packages remained constant with tenure. A supplemental analysis of our data did in fact indicate that CEO tenure had a negative and significant association with the percentage of pay granted in long-term form. This result suggests that the composition—but not the total value—of pay packages shifted with tenure, away from long-term compensation and toward cash-based pay.

Table 3 also indicates that the control variable for years of company tenure prior to becoming CEO had a negative and significant relationship with all forms of CEO pay. Therefore, executives who needed more years of seasoning prior to assuming the top job appear to have commanded less in the market for managerial labor.

As shown in Table 3, being a founder was significantly and negatively related to all three forms of pay. So, as predicted, CEO-founders were indeed paid less than nonfounders. To further explore this relationship, we conducted supplementary analyses to determine whether the founder effect was more of a symbolic action on the part of founding CEOs (i.e., they set an example by taking less), or was explained simply by the fact that founders tended to own a great deal of equity in their firms. Specifically, we included a variable that measured the number of shares owned by CEOs as a percentage of total shares outstanding. In these models, the founder variable remained significant and negative, but the ownership effect was not significant. This pattern suggests that founder effects are not simply explained by equity ownership and that founders, by not placing their monetary self-interest first, may use their own compensation to send a symbolic message to stakeholders.

As mentioned above, our primary measure of organizational performance (prior-year ROA) exhibited no relationship with CEO compensation. To check

the robustness of this finding, we assessed firm performance in several additional ways. First, current-year ROA and the average of ROA in the current and the two prior years were each measured. Second, we assessed current-year ROE, prior-year ROE, and the average of ROE in the current and two prior years. Third, because some CEOs may be paid to turn around poorly performing organizations, change in ROA from the prior to current year was calculated. In addition, because CEOs may be evaluated by how well they perform relative to other firms in their industry, we calculated industry residuals of ROA. Finally, in an effort to include a market-based measure of performance, we calculated the percentage change in stock price from the prior year. All of these analyses revealed that the relationship between firm performance and CEO pay was not significant.

DISCUSSION

Primary Implications

This study has considered how a firm's diversification strategy, its approach to technology, and the size of its top management team contribute to the information-processing demands of the CEO's job. We expected that CEOs who took on jobs with high information-processing demands would be rewarded in the market for managerial labor. There was support for many of our hypotheses (Table 4) and, as is discussed below, the overall pattern of results seems to provide numerous insights that go beyond those provided by prior work on CEO compensation. The following discussion first examines results that relate to a firm's approach to technology and then considers the results that pertain to diversification strategy and TMT size.

Technology effects. As noted in Table 4, capital investment activity, which is typically an indicator of vertical integration and the internal sharing of production technology (Chatterjee & Wernerfelt, 1991; Harrigan, 1984), was positively associated with all three forms of CEO pay. These results are particularly noteworthy because they run counter to Hambrick and Finkelstein's (1987) prediction of a negative link between capital intensity and CEO compensation. Specifically, those authors argued that because of rigidity in production processes and the inertial effects of long-term commitments to fixed investments, CEOs in capital-intensive firms (which are likely to exhibit high levels of capital investment activity) would have limited discretion. This argument led them to predict that such CEOs would be paid less. However, our results, which reveal a positive link between capital investment activity and CEO pay, challenge this expectation. Although high levels of capital investment activity may limit a CEO's future options (cf. Hambrick & Finkelstein, 1987), the information-processing demands associated with such activities may result in CEOs' playing a more (rather than a less) vital role in capital-intensive firms. Rather than simply constraining CEOs and limiting their discretion, high levels of capital investment activity may provide chief executives with unique opportunities to influence firm-level outcomes.

Therefore, it appears that an information-processing perspective on compensation yields insights beyond those in the literature.

Our theory also led us to hypothesize a positive relationship between R&D activity and some forms of CEO compensation. Specifically, we expected there would be a positive relationship between R&D activity and both long-term and total pay. In comparison, we did not expect that R&D-based informational demands would be reflected in cash pay. As is reported in Table 4, each of these hypotheses was supported. We noted earlier that agency theory provides a rationale for why principals may prefer to compensate agents who oversee R&D activities with long-term rather than cash pay (Arrow, 1962; Galbraith & Merrill, 1991). Moreover, such arguments imply that the *ratio* of long-term to cash compensation will increase with increasing R&D activity. However, agency theory provides little indication of how *total* compensation might covary with R&D activity. For instance, an increase in the ratio of long-term to cash compensation could be accomplished by increasing long-term pay or decreasing cash-based pay, or by some combination of the two. In turn, total pay might increase, decrease, or remain relatively unaffected, yet agency theory offers little suggestion as to what the net effect might be.

In an additional analysis, we examined the ratio of long-term to cash pay and found that R&D activity did indeed have a positive association ($p < .001$) with this measure. More important, we discovered that this increased ratio was obtained by increasing long-term pay while leaving cash compensation relatively unaffected—thus, total pay was also positively related to R&D activity. Although agency theory can account for the change in ratio, the above arguments suggest that it cannot account for the resulting increase in total pay. Yet that effect is consistent with an information-processing perspective, whereby the increased demands of managing R&D activities are rewarded with increased long-term and total pay.

It should be noted that these results are somewhat similar to those reported by Balkin and Gomez-Mejia (1987). In a study of the policies used to determine the pay of scientists and engineers, those authors found that high-tech firms used a higher proportion of incentive pay and a lower proportion of fixed pay than firms outside the high-tech sector. This finding raises the question for our study of whether R&D activity was simply serving as a proxy for firms located in the high-tech sector. To probe this issue, we conducted another supplemental analysis in which we examined only firms in the chemicals, natural resources, and conglomerate industries (excluding firms in the high-tech equipment industry). The results for R&D activity were essentially the same as those shown in Table 3. Thus, the relationships between CEO pay and R&D activity reported here not only reinforce the findings of Balkin and Gomez-Mejia but also suggest that R&D activity is related to executive pay in firms outside the high-tech sector.

Although it is not directly related to information-processing demands, one final item should be noted about the relationships between R&D activity

and CEO pay. As Table 4 shows, we predicted and found support for a positive relationship between R&D activity and long-term pay and a null relationship between that activity and cash compensation. In making those predictions, we drew on agency theory, which indicates that because R&D activities are difficult for investors to monitor, owners will tend to compensate the executives who oversee such activities with long-term pay rather than cash (Arrow, 1962; Eisenhardt, 1989b). Yet agency theory is not entirely consistent on this issue. That theory also indicates that when outcomes are uncertain (as is the case with R&D), principals will have incentives to compensate agents using fixed salary rather than long-term, contingent pay. This may occur because high levels of outcome uncertainty make it increasingly expensive for principals to shift risk (via long-term pay) to agents (Eisenhardt, 1989b: 61). So overall, agency theory offers conflicting arguments about whether R&D activity will be associated with high cash compensation or high long-term pay.

On this issue, our results once again reinforce those of Balkin and Gomez-Mejia (1987). Matching their finding that scientific personnel in high-tech firms were compensated using a higher proportion of incentive pay (compared to levels in other firms) and a lower proportion of fixed pay, we found that CEOs overseeing higher levels of R&D activity were paid more in long-term compensation than other CEOs and that cash-based pay was unrelated to such activity. In terms of agency theory, these results suggest that the advantages of using contingent pay (which helps to overcome the difficulties of monitoring R&D activities) may outweigh the advantages of using fixed pay (which avoids the costs of shifting risk to agents). Future compensation studies might further address this inconsistency within agency theory in light of these empirical findings.

Diversification effects. Table 4 also notes that cash compensation was significantly lower in conglomerates than in related diversifiers. This finding suggests that the hands-on management skills typically used in related diversifiers were accorded a higher cash-based value in the market for managerial labor than were the arm's-length, financial control skills most often used in conglomerates. Such a result is particularly interesting because prior work by O'Reilly and colleagues (1988) revealed that the CEOs of conglomerates were paid significantly more cash compensation than top executives in non-conglomerates. Indeed, in terms of raw numbers alone, the CEOs of the conglomerates in our sample were also paid substantially more in cash than were the top executives in the chemical, natural resources, and high-tech equipment industries (see Table 1). However, conglomerates also tended to be more diversified and to have less capital investment activity, and they were less likely to be managed by founding CEOs. Without these factors taken into account, the simple correlation between conglomerate diversification and cash compensation was positive and significant ($r = .21, p < .01$); however, that same relationship became significant and negative once those

factors were controlled. Again, this result suggests that viewing CEO compensation as a function of information-processing demands provides fresh insights.²

The number of businesses managed was expected to have a positive relationship with CEO pay, because managing more businesses would contribute to the volume and variety of information to be processed (Jones & Hill, 1988; Kotter, 1982; Schroder et al., 1967). Moreover, we expected this relationship to be especially pronounced in conglomerate diversifiers. In related diversifiers, the repeated use of a common set of core skills across multiple businesses should reduce information-processing demands, but there would not be a similar effect in conglomerates (Campbell, 1988; Rumelt, 1974). As Table 4 reports, number of businesses was positively related to all three forms of CEO pay. However, the conglomerate-by-number-of-businesses interaction was not significant. Therefore, number of businesses was positively related to CEO pay regardless of diversification strategy.

As to why the conglomerate-by-number-of-business interaction was not significant, we speculate that related diversification may produce a pair of forces that have offsetting effects on information-processing demands. On the one hand, reusing the same core skills and competencies to manage multiple businesses may indeed decrease those demands (Campbell, 1988; Rumelt, 1974; Wood, 1986). However, such gains in processing efficiency may be offset by the fact that managing a collection of related businesses requires unique skills (e.g., identifying and leveraging core competencies) that are above and beyond those required to manage the same businesses in isolation (Prahalad & Bettis, 1986; Prahalad & Hamel, 1990). If this is the case, it would explain why information-processing demands, and as we reported, CEO pay, were positively associated with the number of businesses managed in both related and conglomerate diversifiers.

TMT size effects. We expected that top management team size would have a negative association with pay because larger teams would allow CEOs to download more of their information-processing responsibilities. In addition, we argued that this effect would be less pronounced in

² As reported in Table 4, the conglomerate main effect was the only variable for which there was a significant effect for either cash or long-term pay that was not also reflected in total pay. Since we hypothesized that conglomerate diversification results in lower information-processing demands, the lack of association between the conglomerate variable and total CEO pay might appear troubling. However, we believe that lack of association is mostly an artifact of the null relationship between the conglomerate variable and long-term pay. As shown in Table 3, the sign of the conglomerate coefficient was negative for cash, long-term, and total pay. However, the standard error of this coefficient was particularly large in the model of long-term pay (s.e. = 1.49 for long-term vs. s.e. = 0.16 for cash). Therefore, it is unlikely that a significant relationship with total pay would be revealed because the noise in the long-term component tended to overwhelm the significance of the cash-based component.

conglomerates than in related diversifiers (i.e., that there would be a positive effect for the conglomerate-by-TMT-size interaction). As noted in Table 4, that interaction did have a positive association with cash and total pay; however, the main effect of TMT size was not related to any of the measures of CEO compensation. Taken together, these results suggest that larger TMTs are associated with higher cash and total compensation, but only in conglomerates.

This pattern of findings may have occurred because TMT size has a more complex relationship with information-processing demands than we originally hypothesized. On the one hand, larger TMTs may reduce the magnitude of the operational and strategic information-processing tasks facing CEOs. However, a large TMT also increases the number of executive interactions that a CEO must oversee, thus increasing his or her information-processing load. In turn, managing such executive interactions may have a particularly pronounced effect on CEOs' information-processing demands in conglomerates. Related diversifiers, in order to achieve economies of scope, tend to stress cooperation among business units (Hill, Hitt, & Hoskisson, 1992). Therefore, TMT members in such firms may often create cooperative relationships among themselves that require relatively little oversight on the part of the CEO. In contrast, conglomerate diversifiers, which seek governance economies through the operation of internal capital markets, tend to encourage competition among their business units (Hill et al., 1992). As a result, TMT members in conglomerates, who compete directly with one another for capital, may engage in extensive politicking. Such behavior would likely force CEOs to act as interunit arbitrators and negotiators, thus increasing their information-processing demands. If this is the case, a larger TMT would increase the information-processing demands facing CEOs in conglomerates but have little net effect on those demands in related diversifiers. In turn, this would be consistent with our results regarding TMT size and CEO pay.

Further Thoughts on Paying for Information Processing

Paying for information processing rather than performance. Chief executive compensation has been a topic of great interest in the business press during the past several years, and that interest does not appear to be declining. Moreover, because there is typically little or no relationship between pay and firm performance, the most common theme has been that CEO compensation is without rhyme or reason. We believe that the results of the present study challenge such a conclusion.

Although we too found no association across firms between pay and financial performance, the results clearly suggest that CEO compensation is related to the nature of the job that top executives undertake. However, the relationship is between pay and the information-processing demands rather than between pay and the financial performance that CEOs deliver in those

jobs.³ Yet this formulation begs the question, Why might CEOs be compensated for processing information rather than for achieving high levels of financial performance?

Previous work on labor markets indicates that when there is uncertainty or ambiguity in evaluating an individual's contribution, the relationship between pay and performance is likely to be weak (Konrad & Pfeffer, 1990; Pfeffer, 1977). As Finkelstein and Hambrick noted, "managerial contributions are elusive" (1988: 547), and despite top executives' perceived importance in modern organizations, we know painfully little about what they do or why some are more effective than others (Kotter, 1982). Therefore, because boards of directors often lack a clear-cut way to assess the marginal contributions of CEOs, they may rely on proxies when assigning value to those contributions (Finkelstein & Hambrick, 1988). If boards feel that they can better assess information-processing demands than managerial performance, and if boards perceive few executives as being capable of handling high levels of such demands, then those demands themselves may become an important yardstick for measuring a CEO's contribution.

Information processing, job complexity, and firm performance. If chief executives are paid for information-processing demands rather than financial performance, another question emerges: How is paying in accordance with such demands likely to affect firms' long-term performance? We address this question in two stages: (1) we consider the potential relationship between information-processing demands and job complexity and (2) we consider the potential effects of paying chief executives in relation to the complexity of their jobs.

The literature on job design and analysis identifies a number of factors—such as conflicting interdependencies among task demands, and uncertainty among cause-effect linkages—that affect job complexity (Latham & Yukl, 1975; Locke et al., 1981; Terborg & Miller, 1978). Campbell (1988) argued that the many and varied contributors to job complexity are interrelated because they all affect information-processing demands. In other words, complex jobs are those that place high information-processing demands on the person who occupies the job. If information-processing demands and job complexity are highly interrelated, the arguments presented below suggest that paying for such demands—and hence, for complexity—may have positive as well as negative effects on firms' long-term performance.

³ Our findings do not entirely rule out a longitudinal association between CEO pay and firm performance in this sample. Murphy (1985) showed that although there may be no cross-sectional relationship between performance and CEO pay, over a period of years CEOs are paid relative to their own firms' past performance. Cross-sectional analyses like ours cannot control for unobserved effects that remain constant across time (e.g., unwritten corporate pay policies or levels of executive ability). Consequently, such analyses may not detect longitudinal, within-firm associations between pay and performance. In contrast, time-series analyses can implement fixed-effect models that account for all time-invariant differences across firms, both observed and unobserved (Greene, 1993). Such approaches better enable the detection of within-firm and within-executive relationships between pay and performance (Murphy, 1985).

On the plus side, paying CEOs to manage complexity might enhance an organization's long-term viability. For example, Miller (1993) recently argued that successful organizations often become increasingly "simple" because they focus narrowly on a single theme or activity. Although such simplicity can lead to greater efficiency in the short run, it may ultimately result in failure: simple organizations may lack the internal variety (cf. Buckley, 1968) that is needed to respond appropriately to a complex and changing environment. Thus, rewarding a CEO for the complexity of his or her job—which is directly related to the complexity of an entire firm—might enhance long-term viability by fostering internal variety. Indeed, the literature on uncertain imitability and the resource-based view of the firm (e.g., Barney, 1991; Rumelt, 1984) offers similar suggestions. According to that literature, a firm can gain sustained competitive advantage by assembling a collection of components (businesses, skills, etc.) whose internal workings and relationships are so complex that competitors find them difficult to imitate.

Alternatively, rewarding CEOs for managing complexity might have negative effects on firm performance. If CEOs realize their pay is based on complexity, they might engage in self-serving behaviors aimed at legitimizing higher pay rather than creating value for shareholders. For instance, CEOs might try to persuade board members that their jobs are more complex and involve far higher information-processing demands than they actually do. If such attempts to look busy or important began to crowd out attention to substantive strategic and operating issues, firm performance could decline (Finkelstein & Hambrick, 1988). Similarly, CEOs might try to actually make their jobs and firms more complex by, for instance, diversifying into peripheral areas. If this action causes firms to stray too far from their core capabilities, performance would likely suffer (Prahalad & Bettis, 1986).

Striking a similar note, agency theorists have examined the incentives that CEOs have to make their firms larger and more diverse (e.g., Gomez-Mejia et al., 1987; Murphy, 1985). However, our findings indicate that even if firm size and diversity are held in check, CEOs might still have monetary incentives to alter the makeups of their firms in ways that would depart from shareholders' interests. For example, the CEOs in our sample were not paid for achieving short-term profitability; however, they were paid for overseeing R&D and capital investment activities. Thus, CEOs may have incentives to increase R&D and capital investments, perhaps into areas in which their firms have little expertise, and perhaps even at the expense of short-term profitability. This idea is intriguing because a common criticism of U.S. executives is that they overemphasize short-term profitability at the expense of long-term investments in R&D and manufacturing capabilities (Hayes & Abernathy, 1980). If, consistent with our findings, U.S. CEOs are paid for managing information-processing demands and complexity rather than for short-term performance, we need to ask (1) are criticisms such as Hayes and Abernathy's valid? and (2) if CEOs had such incentives, why did U.S. firms dramatically decrease their investments in R&D and capital equipment during the 1980s? (cf. Smith & Treece, 1990; Spiers, 1991).

Limitations

Like all research, this study has limitations. As noted earlier, we used archival data to assess the information-processing demands confronting CEOs, and an extensive stream of research (e.g., Chandler, 1962; Galbraith, 1973; Kotter, 1982; Thompson, 1967) indicates that the independent variables examined here (e.g., number of businesses) are valid indicators of such demands. Nevertheless, future studies that employ more direct measures of information processing, such as interviews with CEOs and direct observation, are needed to identify the specific manner in which such variables contribute to managerial complexity.

As was also noted earlier, this study assessed how several firm-level factors affect information-processing demands. Yet factors external to firms, such as the degree to which they operate in turbulent environments, might also affect such demands. External environment was not assessed in this study because the net effect of environmental turbulence on managerial information processing is unclear. Turbulent environments have been argued to increase the information-processing demands confronting managers (Daft & Lengel, 1986; Huber & McDaniel, 1986). But many firms successfully cope with such environments by decreasing their information-processing activities (Fredrickson & Iaquinto, 1989; Fredrickson & Mitchell, 1984). Again, future studies that employ more direct measures of information processing might address this point and thus examine the relationship between environmental turbulence and CEO pay.

Prior research also indicates that information-processing activities vary not only across jobs, but also with the type of person in a given job (Agarwal, 1981; Campbell, 1988; Hambrick & Mason, 1984). For instance, even among CEOs in similar firms, those with an internal locus of control might process more information than those with an external locus of control (cf. Miller, Kets de Vries, & Toulouse, 1982). Therefore, future studies might consider how differences in executives' personalities and functional backgrounds affect information processing and whether such individual differences (either along or in combination with firm-level factors) are reflected in executive pay.

Concluding Comments

This study indicates that a CEO's pay is positively associated with the information-processing demands placed on that individual. Moreover, this information-processing perspective offers insights not revealed by other theoretical perspectives. In addition, we found that two other variables not previously examined in the compensation literature—founder status and years of company tenure prior to becoming CEO—were negatively related to CEO compensation. The results relating to being a firm's founder are particularly interesting because they suggest that CEO compensation may be used to send a powerful symbolic message to organizational stakeholders. Therefore, further attention to the symbolic aspects of CEO pay seems warranted.

Additional work that explores various aspects of information-processing demands also seems likely to open new avenues of inquiry. For example, we noted above that paying CEOs in accordance with such demands may have both positive and negative implications for firm performance. Thus, one might ask, what environmental conditions make it more or less beneficial to pay executives on such a basis? Similarly, do firms pursuing certain strategies find it more or less beneficial to pay in accordance with information-processing demands? We also expect that information-processing demands may be highly related to the level of complexity executives face in their jobs. Thus, future studies might try to distinguish between complexity that enables firms to cope with changing circumstances (cf. Miller, 1993) and complexity that exists only to justify higher pay for a CEO. These issues and others suggest that devoting attention to the concepts of information-processing demands and managerial complexity might improve not only our understanding of executive compensation, but also our understanding of how such factors moderate the link between executive compensation and firm performance.

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EMPLOYEE CREATIVITY: PERSONAL AND CONTEXTUAL FACTORS AT WORK

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This study examined the independent and joint contributions of employees' creativity-relevant personal characteristics and three characteristics of the organizational context—job complexity, supportive supervision, and controlling supervision—to three indicators of employees' creative performance: patent disclosures written, contributions to an organization suggestion program, and supervisory ratings of creativity. Participants (171 employees from two manufacturing facilities) produced the most creative work when they had appropriate creativity-relevant characteristics, worked on complex, challenging jobs, and were supervised in a supportive, noncontrolling fashion.

Numerous commentators have argued that enhancing the creative performance of employees is a necessary step if organizations are to achieve competitive advantage (Amabile, 1988; Devanna & Tichy, 1990; Kanter, 1983; Shalley, 1995). When employees perform creatively, they suggest novel and useful products, ideas, or procedures that provide an organization with important raw material for subsequent development and possible implementation (Amabile, 1988; Staw, 1990; Woodman, Sawyer, & Griffin, 1993). The initiation and implementation of these products enhance an organization's ability to respond to opportunities and, thereby, to adapt, grow, and compete (Kanter, 1983, 1988; March & Simon, 1958; Van de Ven, 1986; Van de Ven & Angle, 1989).

Unfortunately, little is known about the conditions that promote the creative performance of individual employees in organizations. Although numerous studies have attempted to identify the personal characteristics of individuals that predict creative accomplishment (Barron & Harrington, 1981), little of this research has focused on creative achievements in work settings. Moreover, little empirical work has systematically examined the possibility that characteristics of organizational contexts contribute significantly to employees' creative performance at work (Amabile, 1988; Shalley, 1991; Staw, 1990). Finally, although several theorists have called for research

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that addresses the joint or combined effects of personal and contextual factors on employee creativity (cf. Amabile, 1987; Staw, 1984; Woodman et al., 1993), very few empirical studies of this type have actually been conducted.

The purpose of the reported investigation was to address these issues. Specifically, we examined the independent and joint contributions of characteristics of individual employees and of their organizational contexts (i.e., job complexity and supervisory style) to three indicators of creativity in an organizational setting—patent disclosures written, contributions to an organization suggestion program, and supervisory ratings of creativity.

BACKGROUND

The study of creativity has generated a wide-ranging variety of definitions of the concept, some of which define it as a characteristic of a person and others as a process (Amabile, 1988). However, most contemporary researchers and theorists have adopted a definition that focuses on the product or outcome of a product development process (Amabile, 1983, 1988; Shalley, 1991; Woodman et al., 1993; Zaltman, Duncan, & Holbek, 1973). Following this earlier work, in the current study we defined creative performance as products, ideas, or procedures that satisfy two conditions: (1) they are novel or original and (2) they are potentially relevant for, or useful to, an organization. Further, we consider a product, idea, or procedure novel if it involves either a significant recombination of existing materials or an introduction of completely new materials.

Following the conceptualizations of Amabile (1988) and Staw (1990), in our definition we recognize the distinction between creative performance and organizational innovation. That is, creative performance refers to products, ideas, and so forth produced at the individual level, whereas innovation refers to the successful implementation of these products at the organizational level. In the current study, our focus was on the generation of creative outcomes by individual employees, not on the implementation of these outcomes.

Personal Characteristics and Creativity

As noted earlier, a large body of literature has focused on determining a set of personal characteristics and attributes associated with creative achievement (Barron & Harrington, 1981; Davis, 1989; Martindale, 1989). This research has examined personal characteristics ranging from biographical factors to measures of cognitive styles and intelligence (Amabile, 1983; Barron & Harrington, 1981; Davis, 1989; Hocevar & Bachelor, 1989; Woodman & Schoenfeldt, 1989). In general, these studies have demonstrated that a stable set of core personal characteristics, including broad interests, attraction to complexity, intuition, aesthetic sensitivity, toleration of ambiguity, and self-confidence, relate positively and consistently to measures of creative performance across a variety of domains (Barron & Harrington, 1981; Gough, 1979; Martindale, 1989).

A number of questionnaire measures have been developed that attempt to reliably assess these personal characteristics. One of the most widely used and respected of these measures is Gough's Creative Personality Scale (CPS; Gough, 1979; Hocevar & Bachelor, 1989; Kaduson & Schaefer, 1991; McCrae, 1987). The CPS includes 30 items empirically derived from the 300-item Adjective Check List (ACL; Gough & Heilbrun, 1965). In general, the items included are consistent with the core personal characteristics described above as correlates of creativity. For example, high CPS scorers endorse adjectives such as "self-confident," "interests wide," and "reflective" as self-descriptors; low scorers endorse words like "conventional" and "interests narrow."

In Gough's (1979) analysis of the CPS, ratings of creativity from expert judges, faculty members, assessment staff, and interviewers were examined for 12 groups of individuals from a variety of domains (e.g., mathematicians, architects, and research scientists) who had completed the ACL. Correlations of individual ACL items with the creativity ratings were used to select the 30 CPS items. The derived CPS correlated significantly with the creativity ratings in 10 of the 12 groups examined. Moreover, in two cross-validation samples, Gough reported that the CPS correlated significantly with ratings of creative performance. Subsequent research has also supported the validity of the CPS (Kaduson & Schaefer, 1991).

In the present investigation, we used the Creative Personality Scale to assess employees' creativity-relevant personal characteristics and examined the contribution of the CPS to employee creativity. On the basis of the evidence reviewed above, we predicted the following:

Hypothesis 1: An employee's score on the CPS will relate positively to employee creative performance.

Organizational Context and Creativity

Although the search for personal characteristics predictive of creative performance dominated creativity research for several decades, recent research has begun to examine the effects of such contextual factors as goals, deadlines, and expected evaluations on individuals' creative performance (Amabile, 1979, 1982; Amabile, Goldfarb, & Brackfield, 1990; Amabile & Gryskiewicz, 1989; Amabile, Hennessey, & Grossman, 1986; Carson & Carson, 1993; Koestner, Ryan, Bernieri, & Holt, 1984; Kruglanski, Friedman, & Zeevi, 1971; Shalley, 1991, 1995). Most of this research has been conducted in behavioral laboratories and has followed an "intrinsic motivation" perspective. According to this perspective, the context in which an individual performs a task influences his or her intrinsic motivation, which in turn affects creative achievement (Amabile, 1988). Individuals are expected to be most creative when they experience a high level of intrinsic motivation—that is, when they are excited about a work activity and interested in engaging in it for the sake of the activity itself (Amabile, 1983, 1987; Shalley, 1991). Under these conditions, individuals are free of extraneous concerns and are likely to take risks, to explore new cognitive pathways, and to be playful with ideas

and materials (Amabile et al., 1990). They are also likely to stay focused on the internal nature of the task and to work longer on an idea or a problem. Situations that encourage this exploration and persistence should increase the likelihood of creative performance.

Previous research provides some direct support for the importance of intrinsic motivation for understanding creative responses. For example, studies by Amabile (1979) and Koestner and colleagues (1984) showed positive associations between measures of intrinsic motivation and individuals' creative performance on artistic tasks. Intrinsic motivation has been linked to creativity in work organizations as well. In an interview study, 120 scientists engaged in R&D mentioned intrinsic motivation as an important determinant of creative performance more frequently than any other characteristic (Amabile & Grysiewicz, 1987).

We therefore expected characteristics of an organizational context that promote or support intrinsic motivation to enhance creative achievement. In contrast, characteristics of the context that restrict or constrain an individual's excitement in his or her work activities should reduce creativity (Amabile, 1983; Deci & Ryan, 1985; Koestner et al., 1984). In the current study, we focused on two contextual characteristics suggested by previous research and theory as important determinants of intrinsic motivation and creative performance at work: job complexity and supervisory style. Each of these contextual conditions is reviewed separately below.

Job complexity. The design of jobs has long been considered an important contributor to employees' intrinsic motivation and creative performance at work (Amabile, 1988; Hackman & Oldham, 1980; Kanter, 1988; West & Farr, 1989). Specifically, complex, challenging jobs (i.e., those characterized by high levels of autonomy, skill variety, identity, significance, and feedback) are expected to support and encourage higher levels of motivation and creativity than are relatively simple, routine jobs (Deci, Connell, & Ryan, 1989; Hackman & Oldham, 1980). When jobs are complex and challenging, individuals are likely to be excited about their work activities and interested in completing these activities in the absence of external controls or constraints. The level of interest and excitement produced by a job's design is then expected to foster creative achievements at work. In addition, complex jobs may actually *demand* creative outcomes by encouraging employees to focus simultaneously on multiple dimensions of their work, whereas highly simple or routine jobs may inhibit such a focus.

Previous research suggests that complex jobs can have a positive and substantial impact on a variety of work-related outcomes (Cotton, 1993; Fried & Ferris, 1987; Kopelman, 1985). For example, numerous field studies have relied on measures of the five job characteristics identified in the previous paragraph and have demonstrated that an overall index of these characteristics, the Motivating Potential Score (MPS; Hackman & Oldham, 1980), explains substantial amounts of variance in measures of internal motivation (the extent to which employees experience positive feelings when they perform well and negative feelings when they perform poorly), job satisfaction,

and overall performance (Fried & Ferris, 1987). In addition, a few studies have provided some support for the link between the complexity of employees' jobs and their creative responses at work. Hatcher, Ross, and Collins (1989) created a job complexity index by averaging employee reports of three job characteristics: autonomy, variety, and feedback. Their results showed positive, significant relations between this index and the number of new ideas employees submitted to an organization suggestion program. And a study by Amabile and Grysiewicz (1989) demonstrated significant relations between employee self-reports of creativity and of "freedom" and "challenging work."

The current study used the MPS index to assess job complexity and examined the contribution of this index to employee creative achievement. On the basis of the aforementioned arguments, we predicted

Hypothesis 2: A job's score on the MPS index will relate positively to employee creative performance.

Supervisory style. A second salient characteristic of the organizational context that is often considered a potent determinant of employee creativity at work is style of supervision (Amabile & Grysiewicz, 1987, 1989; Deci & Ryan, 1987; West & Farr, 1989). In particular, supervision that is supportive of employees is expected to enhance creative achievement; supervision that is controlling or limiting is expected to diminish creative performance (Deci et al., 1989; Deci & Ryan, 1985, 1987). When supervisors are supportive, they show concern for employees' feelings and needs, encourage them to voice their own concerns, provide positive, chiefly informational feedback, and facilitate employee skill development (Deci & Ryan, 1987). These actions on the part of a supervisor are expected to promote employees' feelings of self-determination and personal initiative at work, which should then boost levels of interest in work activities and enhance creative achievement.

In contrast, when supervisors are controlling, they closely monitor employee behavior, make decisions without employee involvement, provide feedback in a controlling manner, and generally pressure employees to think, feel, or behave in certain ways (Deci et al., 1989). Supervision that is experienced as controlling undermines intrinsic motivation and shifts an employee's focus of attention away from work activities and toward external concerns (Deci et al., 1989; Deci & Ryan, 1987). This reduction in intrinsic motivation is then expected to lower creative performance.

A few studies provide some support for the proposed effects of supportive behavior on intrinsic motivation (e.g., Deci, Schwarz, Sheinman, & Ryan, 1981; Ryan & Grolnick, 1986; Zuckerman, Porac, Lathin, Smith, & Deci, 1978). For example, Zuckerman and colleagues (1978) found that when individuals were given choices about which tasks to complete and how much time to allot to each, they were significantly more intrinsically motivated than individuals who were not offered choices. In addition, Harackiewicz (1979) demonstrated that individuals who were given positive informational feedback about their task performance (i.e., "you performed better on these puz-

zles than the average participant") exhibited higher levels of intrinsic motivation than individuals who were given no feedback.¹

Previous research also supports the proposed association between supportive supervision and employee creativity. For example, Stahl and Koser (1978) demonstrated that R&D scientists' creative output was significantly related to the extent to which supervisors were empathic and attempted to understand employees' feelings. West (1989) demonstrated that health care professionals were most creative when their supervisors provided high levels of social support. Carson and Carson (1993) showed that individuals who were given informational feedback about their creativity on the first trial of a task exhibited higher creativity on subsequent trials than individuals who were given no feedback. Andrews and Farris (1967) showed that teams of scientists produced the most creative outcomes when their supervisors provided substantial freedom at work and many opportunities to influence important decisions. Amabile and Gryskiewicz (1989) found significant relations between employee ratings of supervisory encouragement and of creativity. Lastly, Scott and Bruce (1994) demonstrated that professional employees who reported high-quality relationships with their supervisors (relationships characterized by support, trust, and autonomy) were described by those supervisors as more likely to generate creative ideas.

Previous research also provides some support for the association between controlling supervision and lowered intrinsic motivation and creativity. Several studies (e.g., Pittman, Davey, Alafat, Wetherill, & Kramer, 1980; Ryan, 1982; Ryan, Mims, & Koestner, 1983) showed that when performance feedback was offered in a controlling fashion (e.g., "You performed well, just as you should"), participants' intrinsic motivation was adversely affected. Similarly, Lepper and Greene (1975) found that children placed under surveillance exhibited lower intrinsic motivation than those who were not monitored. Regarding creative outcomes, a field experiment by Koestner and his associates (1984) examined the effects of "controlling-limits" on the creativity of children's artwork. The experimenter set limits about being neat while painting a picture. Results demonstrated that children in the controlling-limits condition exhibited significantly lower levels of creativity than children in a no-limits condition. Finally, Stahl and Koser (1978) showed negative relations between employee reports of supervisory control and objective indicators of creative output.

The current study specifically examined associations between the supportive and controlling aspects of supervision and several indicators of employee creative performance. On the basis of the intrinsic motivation perspective and the evidence reviewed above, we predicted the following:

¹ In general, this body of theory and literature focuses on comparisons between no feedback and positive informational feedback. It is also possible that negative informational feedback (feedback that focuses on specific problems with work while providing guidance for future employee behavior) might enhance individuals' intrinsic motivation and subsequent creativity.

Hypothesis 3: Supportive supervision will relate positively to employee creative performance.

Hypothesis 4: Controlling supervision will relate negatively to employee creative performance.

Joint Contributions of Personal and Contextual Characteristics

To this point we have discussed the possible independent contributions of employees' creativity-relevant personal characteristics, job complexity, and supervisory style to creative performance. In addition to examining these independent contributions, we also examined the possibility that these personal and contextual factors combine and interact with one another to influence employee creativity at work.

As noted earlier, commentators have long suggested that personal and contextual factors interact to affect creativity (i.e., Amabile, 1983, 1987; Woodman et al., 1993). Although very few empirical studies have directly examined the joint effects of personal and contextual factors on employee creative performance, previous research has shown that personal, job, and supervisory variables do combine to influence other employee work responses. In particular, studies have established that measures of employees' personal, job, and supervisory characteristics are generally independent of one another (cf. Abdel-Halim, 1981, 1983; Ferris, 1983; Griffin, 1980) and that they often interact to affect such outcomes as satisfaction and work performance (Abdel-Halim, 1981, 1983; Greene, 1979; Griffin, 1980; Johns, 1978). For example, Abdel-Halim (1981) demonstrated that employees experienced high levels of job satisfaction when they worked on complex jobs and were supervised in a considerate, supportive fashion. Other studies have found interactions among supervisory style and employees' personal characteristics (cf. Abdel-Halim, 1981; Keller, 1989; Weed, Mitchell, & Mofitt, 1976). For example, Weed and colleagues (1976) showed that employees low in dogmatism exhibited the highest levels of performance when supervisors were supportive. Finally, a few studies have demonstrated that measures of job complexity, supervision, and employees' personal characteristics jointly combined to affect employees' work responses (cf. Abdel-Halim, 1983; Griffin, 1980; Zierden, 1980). For example, Griffin (1980) found significant relations between employee job satisfaction and a measure of supervisory participative behavior for employees who strongly desired growth and development at work and worked on complex jobs.

In the present investigation, we built upon this earlier literature and posited a multiplicative model of creative performance involving employees' creativity-relevant personal characteristics, job complexity, and supervisory style. In essence, this model suggests that employee creativity is maximized when high levels of all the aforementioned conditions (Creative Personality Scale, Motivating Potential Score, and supportive and noncontrolling supervision) are present, because a high level of any one condition enhances an employee's ability to respond positively to the other conditions. For example, an employee with a high score on the CPS should exhibit higher creativity

in response to a complex job than an employee with a low CPS score, and this response should be further enhanced when levels of supportive and noncontrolling supervision are also high.

On the basis of the aforementioned arguments, we predicted the following four-way interaction:

Hypothesis 5: Creativity-relevant personal characteristics and contextual conditions will interact in such a way that creative performance will be highest when employees score high on the CPS index, work on high-MPS jobs, and are supervised in both a supportive and noncontrolling fashion.

Finally, in addition to examining the associations between employees' personal and contextual characteristics and creative performance, this study also explored the contributions of these characteristics to two traditional outcomes: overall work performance and intentions to quit (turnover intentions). Since little research has examined employee creativity in the context of more traditionally studied outcomes, the possible effects of combinations of creativity-relevant personal and contextual factors on outcomes such as work performance and intentions to quit remain unknown. This is a potentially significant issue if certain personal and contextual conditions combine to enhance creative achievement while contributing to lowered effectiveness on more traditional dimensions. For example, employees with high scores on the CPS index (high-CPS employees) may respond to noncontrolling supervision by producing more creative work but in the process may also lower their overall work performance. By focusing their energy and attention to produce creative outcomes, high-CPS employees may devote less effort to more traditional dimensions of work, and overall effectiveness may suffer. The current study addresses this possibility by simultaneously exploring the contributions of creativity-relevant personal characteristics, job complexity, and supervisory style to employees' overall work performance and intentions to quit as well as to indicators of creative achievement.

METHODS

Research Setting and Participants

The research was conducted in two manufacturing facilities that produced component parts for technical equipment. Each employee in the two facilities held 1 of 18 different jobs (e.g., design engineer, manufacturing engineer, design drafter, toolmaker, and technician).

Human resources managers from each of the facilities were contacted by the authors and asked to identify individual work units within the facilities for possible participation in the research. Managers were told that the research involved the possible effects of individual and contextual conditions on employees' work-related responses and were asked to identify units that were representative of the organization as a whole. At no time did we express

a particular interest in work units where high creative performance was present or expected.

All employees in the identified units were then contacted and asked to participate. We told employees that the study was designed to assess their responses to their work environments; we did not indicate that creative performance was the focus of the research. A total of 171 employees (118 from facility A; 53 from facility B) agreed to participate in the study. This number reflects a response rate of 87 percent of those originally contacted in facility A and of 75 percent of those in facility B, an overall participation rate of 83 percent. Thirty-seven percent of the participants were women. The mean age was 41 years, and the mean organizational tenure level was 12.75 years. The modal education level was "business college or technical school degree." Interviews with human resources managers indicated that the demographic and job profiles of the respondents were typical of the general population in the participating work units.

Procedures

Three types of data were collected on site. First, employees completed questionnaires at their desks or in a conference room. These questionnaires included items that measured personal characteristics, job complexity, supervisory style, and intentions to quit. Before they completed the questionnaires, employees were told that it was desirable to have their names on the questionnaires for research purposes and were assured that all provided information would be kept completely confidential.

After employee questionnaires were administered, the direct supervisors of the participating employees completed questionnaires that included items measuring each employee's creative and overall performance. Finally, human resource managers provided data on two additional measures of creative performance: patent disclosures written and contributions to an organization suggestion program.

Measures

Creativity-relevant personal characteristics. The 30-item Creative Personality Scale (CPS; Gough, 1979) of the ACL (Gough & Heilbrun, 1965) was used to assess employees' creativity-relevant personal characteristics. Employees were asked to "place a check mark next to each adjective that you think describes you." Of the 30 adjectives, 18 describe highly creative people: capable, clever, confident, egotistical, humorous, informal, individualistic, insightful, intelligent, interests wide, inventive, original, reflective, resourceful, self-confident, sexy, snobbish, and unconventional. Each of these checked adjectives was given a value of +1. The remaining 12 adjectives describe less creative people: cautious, commonplace, conservative, conventional, dissatisfied, honest, interests narrow, mannerly, sincere, submissive, suspicious, and phony.² Each of these checked adjectives was assigned a value of -1. The values were then summed to form a CPS index.

² After pretests, we selected "phony" to replace the original item, "affected."

Reliability of the CPS index was calculated via a weighted composite technique (Lord & Novick, 1968). We generated a positive subscale including the 18 adjectives that describe highly creative people and a negative subscale including the 12 adjectives associated with less creative individuals. A separate Cronbach's reliability coefficient was calculated for each of these subscales (alpha+ and alpha-). We then calculated the reliability of the total CPS index using a linear combination weighted for the number of items on each subscale and the correlation between the subscales.³ The reliability of the CPS index was .70.

Job complexity. Fifteen items from the Job Diagnostic Survey (Hackman & Oldham, 1980) were used to assess the challenge and complexity of employees' jobs. Three items for each of five job characteristics (autonomy, skill variety, task identity, task feedback, and task significance) were averaged to form a summary index for that characteristic. We then combined these indexes to form a Motivating Potential Score (MPS) for each job using the formula suggested by Hackman and Oldham (1980): $MPS = (\text{variety} + \text{identity} + \text{significance})/3 \times \text{autonomy} \times \text{feedback}$.⁴

Internal consistency was assessed for each of the five job characteristics as well as for other measures in this study (supervisory style, creative performance, overall performance, and intentions to quit) in terms of Cronbach's reliability coefficient (alpha). The median alpha of the job characteristics measures was .68. Table 1 reports reliabilities for all measures.

Supervisory style. To measure supervisory support and control, we used 12 items. Some of these items were adapted from the Michigan Organizational Assessment Package (1975) and others were written specifically for this study. Items were rated on a seven-point Likert-type scale that ranged from "strongly disagree" (1) to "strongly agree" (7). All items appear in the Appendix.

Independence among the 12 supervision items was assessed with exploratory factor analysis using principal components analysis with varimax rota-

³ The formula used to calculate the reliability of the CPS index was as follows:

$$\text{Total alpha} = \frac{[(n+/n)(\text{alpha}+) + (n-/n)(\text{alpha}-) + 2r(n+/n)(n-/n)]}{(n+/n) + (n-/n) + 2r(n+/n)(n-/n)},$$

where n = the total number of scale items, $n+$ = the number of positive subscale items, $n-$ = number of negative subscale items, and r = the correlation between positive and negative subscales.

⁴ To supplement this measure, we assigned each of the 18 job classifications a substantive complexity score based on those Roos and Treiman (1980) derived from the *Dictionary of Occupational Titles* (U.S. Department of Labor, 1977). This measure has been used in recent studies (e.g., Arvey, Bouchard, Segal, & Abraham, 1989; Gerhart, 1987; Oldham, Kulik, & Stepina, 1991) as a non-self-report index of overall job complexity. When we conducted analyses using this measure in place of the MPS score, virtually identical results were obtained. These results are available from the authors on request.

TABLE 1
Means, Standard Deviations, and Correlations^a

Variables	Mean	s.d.	Reliability	1	2	3	4	5	6	7	8
1. Creativity-relevant personal characteristics	4.26	3.55	.70								
2. Job complexity	143.82	65.39	.68 ^b	.22*							
3. Noncontrolling supervision	4.91	1.09	.67	.12	.50*						
4. Supportive supervision	4.68	1.11	.86	.08	.37*	.38*					
5. Rated creativity	4.60	1.29	.90	.12	.24*	.28*	.14				
6. Patents	0.28	0.87		.27*	.16	.07	-.14	.23*			
7. Suggestions	0.31	0.47		.00	-.05	-.20	-.19	.01	.18		
8. Rated performance	5.19	1.09	.85	.05	.35*	.31*	.29*	.75*	.05	-.02	
9. Intentions to quit	2.52	1.37	.75	.00	-.33*	-.08	-.25*	.03	.12	.01	-.08

^a $N = 171$.

^b This value represents the median reliability of the five measures of job characteristics.

* $p < .05$, two-tailed test

tion. Two factors emerged from this analysis accounting for 52.9 percent of the variance. The first factor (eigenvalue = 4.57) was composed of the eight items with factor loadings ranging from .52 through .79 and reflected "supportive supervision." The second factor (eigenvalue = 1.78) was composed of the remaining four items (loadings .57-.78) and reflected "controlling supervision." We averaged item scores for both factors to form indexes. Certain items on each index were reverse-coded so that high scores on the indexes reflect supportive and noncontrolling supervision.

Creative performance ratings. Supervisors rated the extent to which each employee produced work that was novel and useful to the organization. Three items developed for this study were used to assess creativity and are reported in the Appendix. Ratings were made on seven-point Likert-type scales and were averaged to form a rated creativity index.

Patent disclosures written. When employees developed product or process ideas that were deemed by their supervisors to be very original and relevant to the organization or the industry in general, they were invited to write a patent disclosure. Patents and patent applications are commonly used measures of creative output (cf. Keller & Holland, 1983; Pelz & Andrews, 1966), and the patent disclosure measure used here reflects the first step in the patent application process. This measure specifically assesses the number of internal patent disclosures written by an employee over a two-year period. Ratings on this measure ranged from 0 through 2.

Contributions to a suggestion program. Employees were also invited to submit recommendations to a formal organization suggestion program. The suggestion program, which was separate from the patent disclosure process, usually involved ideas about procedural or process changes in work methods (e.g., changes in quality inspections or waste disposal techniques). A multi-functional committee regularly reviewed all submitted recommendations and accepted only those that were considered novel and appropriate for organizational implementation. This measure assesses whether an employee's recommendations were accepted (i.e., judged creative) by the review committee over the same two-year period. When an employee's suggestions were accepted, this measure was coded 1; when not accepted, the suggestions measure was coded 0.

Overall performance ratings. Using three items suggested by Hackman and Oldham (1976), supervisors of each employee rated his or her performance on three dimensions: work quantity, work quality, and amount of effort. Ratings were made on seven-point Likert-type scales and averaged to form a rated performance index.

Intentions to quit. We averaged three items suggested by Colarelli (1984) to form an index of intentions to quit. Items were measured on a seven-point Likert-type scale that ranged from "strongly disagree" (1) to "strongly agree" (7). Numerous studies have demonstrated that similar measures relate significantly to subsequent employee turnover (Hom, Griffith, & Sellaro, 1984; Rosse & Hulin, 1985).

RESULTS

Relations among the Measures

Table 1 presents correlations and descriptive statistics for all measures included in the research.⁵ The measure of creativity-relevant personal characteristics (CPS) is positively and significantly related to the measure of job complexity (MPS). However, CPS does not relate significantly to the measures of supervision. The job and supervision measures are all positively and significantly related to one another.

The three measures of creativity are all positively related to one another, but only the relation between patents and rated creativity is statistically significant. Rated creativity also correlates positively and significantly with rated performance, demonstrating that individuals rated high on the traditional performance measure are also rated as highly creative. The last outcome measure, intentions to quit, does not correlate significantly with the other outcomes.

Correlations between CPS and the three creativity indicators are shown in Table 1 and provide only partial support for Hypothesis 1. Specifically, CPS correlates positively and significantly with one of the creativity indicators (patents) but not with the remaining two indicators (rated creativity and suggestions). In addition, the relations between CPS and the supplementary outcomes, performance and intentions to quit, are nonsignificant.

Results shown in Table 1 also provide partial support for Hypothesis 2. Job complexity (MPS) correlates positively and significantly with only one of the three creativity indicators: rated creativity. In addition, MPS relates positively and significantly to rated performance and negatively and significantly to intentions to quit.

The results shown in Table 1 provide no support for Hypothesis 3. There are no significant associations between supportive supervision (SS) and the creativity indicators. However, supportive supervision does relate significantly to both rated performance and intentions to quit. Finally, noncontrolling supervision (NS) correlates positively and significantly with one measure of creative performance (rated creativity), providing partial support for Hypothesis 4. Noncontrolling supervision also relates positively and significantly to rated performance.

Hierarchical Regression Analyses

To examine the joint contributions of the CPS and the context measures to the explanation of the creativity and supplementary outcomes, we con-

⁵ The low means of the patent and suggestion measures shown in Table 1 reflect the somewhat positively skewed distributions of these variables, which is not uncommon in field research on creativity and innovation (cf. Keller & Holland, 1983; Owens, 1969; Pelz & Andrews, 1966). Using both square root and logarithmic transformations of these two variables, we repeated all correlational and regression analyses reported below and obtained results virtually identical to those obtained using the original measures. Given these findings, and noting that regression analyses are generally robust even in the presence of departures from assumptions of normality (Pedhazur, 1982: 34), we report results using the original patent and suggestion measures.

ducted hierarchical regression analyses. Since our primary interest was the contribution of the four-way interaction involving CPS, MPS, and noncontrolling and supportive supervision (Hypothesis 5), it was necessary to control for the independent effects of these variables and the lower-order interactions among them (Aiken, West, & Reno, 1991; Cohen & Cohen, 1983; Peters, O'Connor, & Wise, 1984). Thus, we entered main effects into the equations first, followed by the 6 two-way interactions, the 4 three-way interactions and, finally, the 1 four-way interaction.⁶ We emphasize interpretation of the increased squared multiple correlation (R^2) that results from including a particular predictor in a regression equation as an indication of its importance, because the multicollinearity present when both main effects and interaction terms are included in equations results in unstable and thus uninterpretable regression coefficients (Hom et al., 1984; Miller, Katerberg, & Hulin, 1979; Pedhazur, 1982). Table 2 summarizes results.

Results indicate that the independent effects of the CPS and organizational context measures together explained significant amounts of variance in two of the three creativity indicators: rated creativity and patents. Specifically, the main effects alone accounted for 10 percent of the variance in rated creativity and 12 percent of the variance in patents. The main effects also explained a significant amount of variance (16%) in the two supplementary outcomes: rated performance and intentions to quit.

The contributions of the interaction terms, however, differ substantially between the creative performance and the supplementary outcomes. As Table 2 shows, none of the two-, three-, or four-way interaction terms contribute significantly to the performance and intentions to quit measures. Indeed, the entire *set* of interaction terms explains only 4–6 percent of the variance in these supplementary outcomes. On the other hand, several of the interaction terms contribute significantly to the creativity measures, and the set of interaction terms explains 14–22 percent of the variance in these three indicators.⁷

⁶ We introduced the two- and three-way interaction terms into the equations in all possible orders, obtaining results virtually identical to those reported in Table 2.

⁷ It is possible that the types of jobs employees hold may influence the contextual factors they experience and the creative outcomes they produce. For example, employees in professional or engineering jobs may receive more supportive supervision or have more opportunities to produce patents than employees in nonprofessional or technical jobs. To examine this possibility, we created a dummy variable representing this job type distinction. Employees holding professional/engineering jobs (e.g., design engineer and manufacturing engineer) were coded 1; those holding nonprofessional but technical jobs (e.g., toolmaker and quality control technician) were coded 0. Correlations between this dummy variable and all measures included in the research showed no significant associations (all p 's > .05). Next, we repeated the regression analyses appearing in Table 2, after controlling for job type. In these analyses, the job-type variable was introduced first into the equations, followed by the steps as described above (i.e., CPS, MPS, etc.). Results showed that job type did not make significant contribution to any of the outcomes. Moreover, all of the significant main and interaction effects shown in Table 2 remained statistically significant ($p < .05$) after the introduction of the job-type variable. In total, these results suggest that job type does not affect the relations examined in this study. Details of these results are available on request.

TABLE 2
Summary of Results of Hierarchical Regression Analyses

Variables	Rated Creativity		Patents		Suggestions		Rated Performance		Intentions to Quit	
	R ²	ΔR^2	R ²	ΔR^2	R ²	ΔR^2	R ²	ΔR^2	R ²	ΔR^2
Creativity-relevant personal characteristics (CPS)	.01	.01	.07*	.07*	.03	.03	.00	.00	.00	.00
Job complexity (MPS)	.06*	.05*	.08*	.01	.04	.01	.12*	.12*	.12*	.12*
Noncontrolling supervision (NS)	.09*	.03*	.08*	.00	.06	.02	.14*	.02	.13*	.01
Supportive supervision (SS)	.10*	.01	.12*	.04*	.09	.03	.16*	.02	.16*	.03*
CPS \times MPS	.17*	.07*	.12*	.00	.17*	.08*	.17*	.01	.16*	.00
CPS \times NS	.18*	.01	.13*	.01	.21*	.04*	.18*	.01	.17*	.01
CPS \times SS	.18*	.00	.14*	.01	.21*	.00	.18*	.00	.19*	.02
MPS \times NS	.18*	.00	.20*	.06*	.21*	.00	.19*	.01	.19*	.00
MPS \times SS	.18*	.00	.21*	.01	.22*	.01	.19*	.00	.19*	.00
NS \times SS	.18*	.00	.22*	.01	.25*	.03	.20*	.01	.19*	.00
CPS \times MPS \times NS	.19*	.01	.24*	.02	.27*	.02	.20*	.00	.20*	.01
CPS \times MPS \times SS	.19*	.00	.24*	.00	.27*	.00	.20*	.00	.20*	.00
CPS \times NS \times SS	.19*	.00	.25*	.01	.28*	.01	.21*	.01	.20*	.00
MPS \times NS \times SS	.19*	.00	.30*	.05*	.28*	.00	.21*	.00	.20*	.00
CPS \times MPS \times NS \times SS	.24*	.05*	.34*	.04*	.28*	.00	.22*	.01	.20*	.00

* $p < .05$

The contributions of the various interaction terms vary somewhat across the three creativity indicators. Specifically, results in Table 2 show a significant CPS-by-MPS interaction and a significant four-way interaction for rated creativity. Results for patents also show a significant four-way interaction, a significant three-way interaction of MPS, noncontrolling supervision, and supportive supervision, and a significant MPS-by-noncontrolling supervision interaction. Results for the third measure of creativity, suggestions, are slightly different. Here, the four-way interaction is not significant, but 2 two-way interactions make statistically significant contributions: $CPS \times MPS$ and $CPS \times NS$.

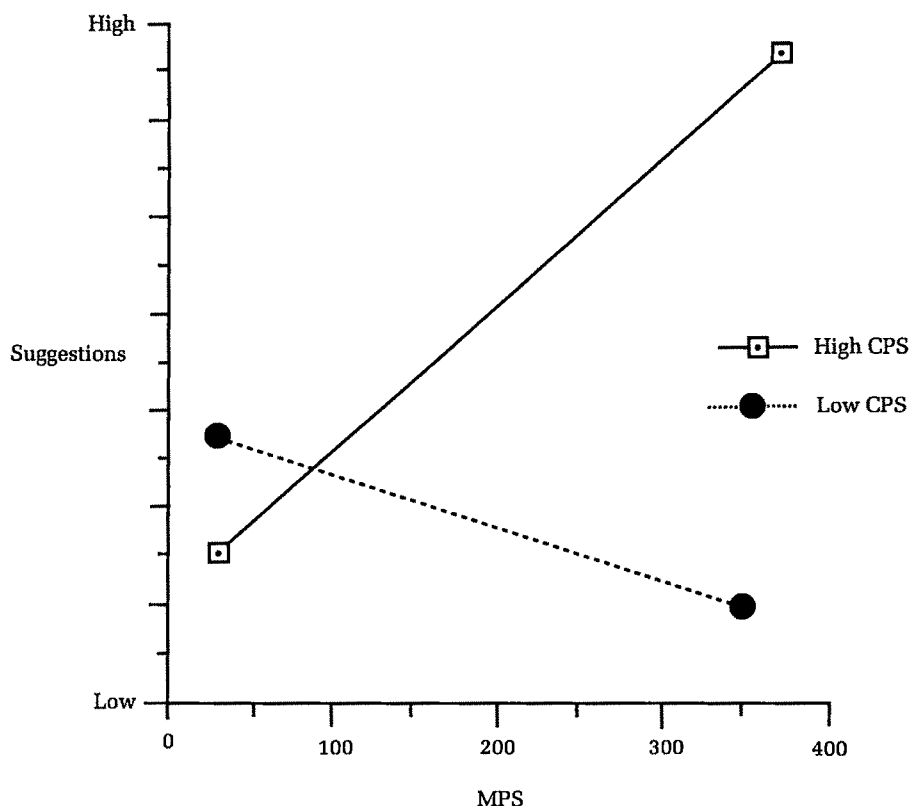
To interpret the interactions, we used procedures suggested by Peters and colleagues (1984) and conducted separate regression analyses for subgroups of the sample. For example, for the significant CPS-by-MPS interactions, we split the CPS measure at the median to form high and low CPS subgroups. We then regressed suggestions and rated creativity on MPS (job complexity) for each subgroup and plotted the within-subgroup regression equations using unstandardized regression coefficients. Figure 1 shows results for the suggestions measure. Results for the rated creativity measure, which are basically identical to those shown, are available on request from the authors.

Figure 1 shows that relations between MPS and the suggestions outcome vary as a function of employees' creativity-relevant personal characteristics. For employees with high CPS scores, the more complex their jobs, the more they produced novel and useful suggestions. But for employees with relatively low CPS scores, the more complex their jobs, the less they produced creative suggestions.

The same procedure was used to illustrate the significant interactive effect of CPS and noncontrolling supervision (NS) on suggestions and the effect of the MPS-by-NS interaction on patents. Both interactions are very similar in form to that shown in Figure 1 and are not displayed here. Specifically, the CPS-by-NS interaction shows that for employees with high CPS scores, noncontrolling supervision has a strong, positive association to the production of novel suggestions. However, for employees in the low CPS group, noncontrolling supervision is very weakly associated with the suggestions measure. Similarly, the significant MPS-by-NS interaction for patents shows that individuals who perform highly complex jobs respond more positively to noncontrolling supervision than employees working on relatively simple jobs. Figures illustrating these interactions are available on request from the authors.

Table 2 also shows a significant effect of the interaction of MPS, noncontrolling supervision, and supportive supervision on patents. To interpret this interaction, we split each of the supervision measures at the median to form subgroups and regressed patents on MPS for each combination of these subgroups (e.g., high NS and low SS, and low NS and low SS). Results were generally consistent with the argument that when all three contextual conditions support intrinsic motivation, creativity is higher than when any

FIGURE 1
Interaction of Creativity-Relevant Personal Characteristics
and Job Complexity for Suggestions

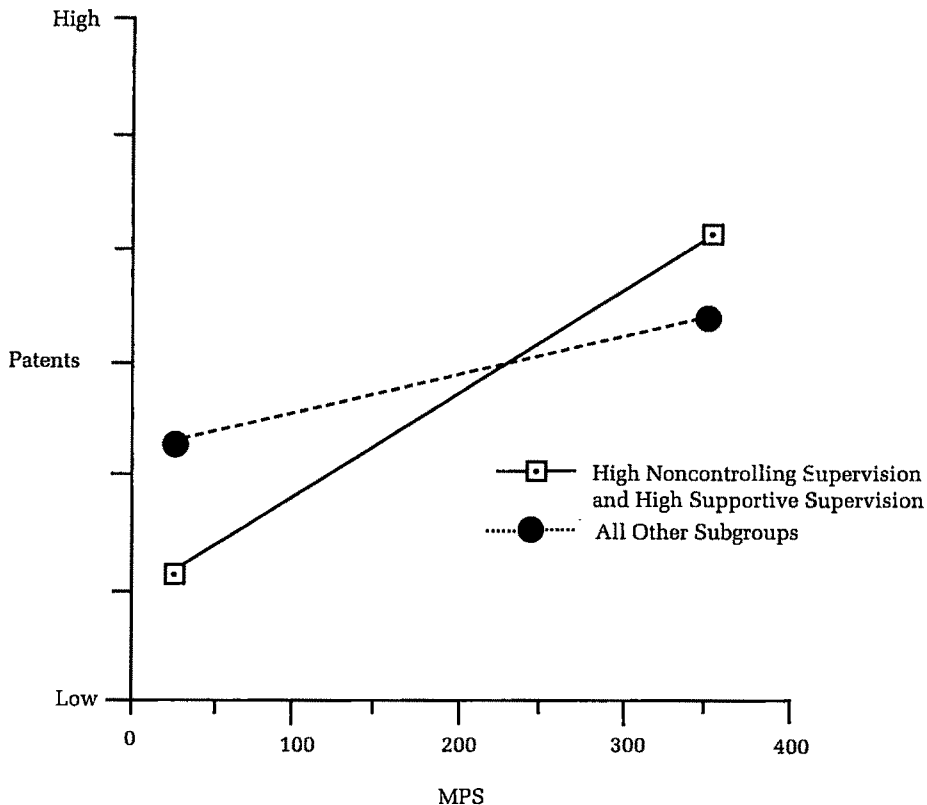


one condition is low. Specifically, results showed that the job complexity measure was more strongly associated with patents when supervision was both supportive and noncontrolling than when one or both of these supervision measures were low. Therefore, to illustrate the interaction, we regressed the patents measure on MPS for the high NS-high SS subgroup and for a new category consisting of employees in the remaining three subgroups: low NS-low SS, low NS-high SS, and high NS-low SS. Figure 2 shows results.

As suggested above, the figure shows a positive relation between MPS and patents when supervisors are both supportive and noncontrolling. However, when supervisors are controlling, nonsupportive, or both, the challenge and complexity of employees' jobs has little relation to number of patent disclosures written.

Interpretation of the two significant four-way interactions (see Table 2) allows us to address Hypothesis 5. This hypothesis predicts that the highest levels of creative performance occur when employees score high on all four

FIGURE 2
Interaction of Job Complexity, Noncontrolling Supervision,
and Supportive Supervision for Patents

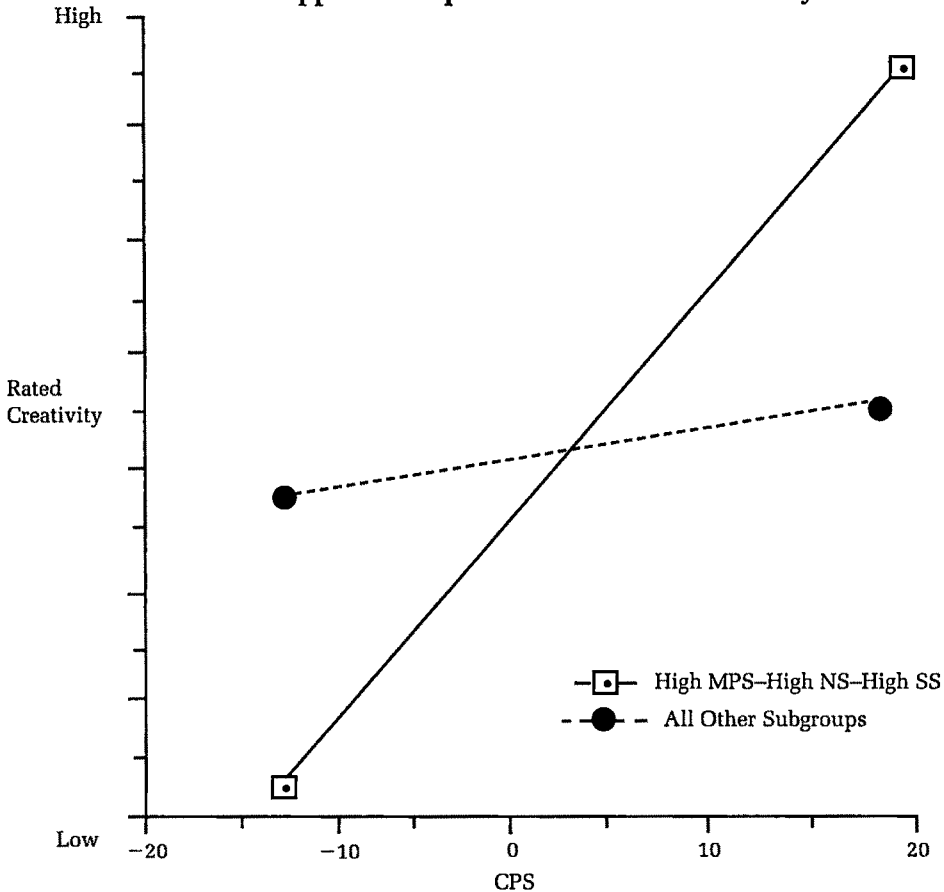


predictors: the CPS index, the MPS index, supportive supervision (SS), and noncontrolling supervision (NS). To examine this interaction, we again split each of the context measures (i.e., MPS, NS, SS) at the median to form subgroups. We then regressed the creativity outcomes (rated creativity and patents) on CPS for each of the eight combinations of these subgroups. As predicted, results showed that the more contextual conditions were high, the stronger the association between CPS and creativity.

Given this pattern of results and Hypothesis 5, we again contrasted regression results for two groups: the high MPS–high NS–high SS and a combination of the seven remaining subgroups (e.g., low MPS–low NS–high SS, high MPS–low NS–high SS, etc.). Figure 3 shows results for rated creativity. Results for patents were virtually identical to those shown in the figure and are available from the authors on request.

The results shown in Figure 3 provide support for Hypothesis 5: creative performance was highest when employees had appropriate creativity-

FIGURE 3
**Interaction of Creativity-Relevant Personal Characteristics,
Job Complexity, Noncontrolling Supervision, and
Supportive Supervision for Rated Creativity**



relevant personal characteristics and worked under conditions expected to foster intrinsic motivation. Specifically, when jobs were complex and supervisors supportive and noncontrolling, CPS was strongly and positively associated with rated creativity. However, when scores were low on one or more of the contextual conditions, CPS had little relation to creative achievement.

DISCUSSION

This study examined the independent and joint contributions of a measure of creativity-relevant personal characteristics (the CPS) and three measures of the organizational context—job complexity, supportive supervision, and noncontrolling supervision—to the explanation of three indicators of employee creativity: patents, contributions to a suggestion program, and

rated creativity. In addition, we examined the contributions of the personal and context measures to two traditional outcomes, overall work performance and intentions to quit (turnover intentions).

In general, results indicated that the contextual characteristics alone contributed independently to the performance and intentions to quit outcomes. Employees exhibited higher performance and lower intentions to quit when their jobs were complex and when their supervisors were described as supportive and noncontrolling.

But a completely different pattern of results emerged for the three creativity outcomes. In addition to the fact that two of the context measures (job complexity and noncontrolling supervision) and the CPS made independent contributions to one creativity indicator, interactive combinations of the CPS and the context measures contributed significantly to each of the creativity outcomes. Specifically, the interaction of the CPS and job complexity and that of the CPS and noncontrolling supervision contributed significantly to the suggestions outcome, and the four-way interaction term involving CPS, job complexity, noncontrolling supervision, and supportive supervision contributed significantly to the patents and rated creativity outcomes.

The direction of the results for patents and rated creativity was as hypothesized: employees produced the most creative work when they had appropriate creativity-relevant personal characteristics (high CPS), worked on complex, challenging jobs (high MPS), and were supervised in a supportive, noncontrolling fashion. The absence of any of these conditions adversely affected creative performance. For the suggestion outcome, results were nearly as expected. Production of novel and useful recommendations to a formal suggestion program was higher when individuals had high CPS scores, complex jobs, and noncontrolling managers. However, supervisory support had little role in predicting this particular indicator of creativity.

These results are generally consistent with earlier "interactionist" approaches to understanding creativity (Amabile, 1987; Woodman & Schoenfeldt, 1989) and suggest that managements should consider both personal and contextual factors to increase creativity in work organizations. Specifically, our results suggest that if creativity at work is to be enhanced, an individualized or selective approach to management may be warranted. For example, individuals with high levels of creativity-relevant personal characteristics might be identified through use of assessment instruments such as the CPS and the normative baselines that accompany these instruments (Gough, 1979). Individuals demonstrating high creative potential relative to these norms might then be surrounded with contextual conditions that support intrinsic motivation. That is, high-CPS employees might be placed in complex, enriched jobs and managed in a supportive, noncontrolling fashion. However, the same contextual conditions should be implemented cautiously, if at all, for individuals with few creativity-relevant personal characteristics. Our results suggest that for low-CPS employees, enriching jobs and managing in a supportive manner may have few beneficial effects or may actually have adverse effects on creative achievement (see Figures 1 and 3). Low-CPS

employees may be overstretched or irritated by certain contextual conditions (e.g., complex, challenging jobs), and respond by lowering their creative output.

In addition, although designing the context in the individualized manner described above appears to be an appropriate strategy if one is interested in maximizing creative achievement at work, our results also suggest that this strategy may complicate efforts to simultaneously maximize general performance effectiveness or to minimize turnover in a work unit. Results indicated that the context measures independently made strong positive contributions to these traditional outcomes, suggesting that performance might be enhanced and intentions to quit lowered if *all* employees were placed in highly complex jobs and managed in a supportive, noncontrolling manner. Thus, if the context is not designed in this fashion for some employees (e.g., if those with few creativity-relevant characteristics are placed on less complex jobs), their general performance and organizational longevity may suffer. This implies that managers may face a dilemma regarding some employees, a conflict between enhancing creative achievement and maximizing traditional outcomes. It also suggests that managers should consider which outcomes they value most before implementing an individualized or more general management strategy.

Although we have discussed several implications of our results for the management of creativity, the research reported here is not without its limitations. First, like the results of other field studies that include multiple measures of creative performance (cf. Pelz & Andrews, 1966), our results indicate relatively low convergence among creativity measures (i.e., ratings, patents, and suggestions; see Table 1). Although rated creativity and patents were positively and significantly correlated with one another, the suggestions measure was not significantly correlated with either other measure of creativity. In addition, as described above, the multiplicative effects of personal and contextual characteristics were similar for rated creativity and patents, but different for suggestions.

One explanation for the lack of convergence between the suggestions measures and the remaining creativity indicators involves the nature of the suggestions measure itself. As mentioned earlier, suggestions was a dichotomous measure. The resulting restricted range may have contributed to the relatively weak associations between this measure and the other indicators of creativity. Future research should examine suggestion measures with a wider range, such as the total number of suggestions accepted by a review committee.

The low convergence between suggestions and patents could also be explained by conceptual and empirical distinctions in the innovation literature. In particular, routine, incremental, or minor innovations have been distinguished from radical or major innovations (Dewar & Dutton, 1986; Ettlie, Bridges, & O'Keefe, 1984; Knight, 1967; Zaltman et al., 1973). Routine innovations represent relatively small changes in an organization's products, procedures, or services. They are new to the organization but reflect an

adaptation or simple adjustment of existing practices, and their implementation rarely requires major changes in organizational structures or processes (Dewar & Dutton, 1986; Knight, 1967). Radical innovations, in contrast, represent larger changes in organizational products, procedures, or services. They reflect broader shifts in perspective and reorientation of existing practices and often require major changes in organizational structures or processes to implement. This distinction is also consistent with the characterization of individuals' creativity styles as ranging from adaptive to innovative (Kirton, 1976, 1989). Employees with adaptive styles work within existing structures to make incremental changes and "do things better." In contrast, employees with innovative styles treat current structures as part of the problem and make more radical changes by "doing things differently" (Kirton, 1976: 622).

Thus, another possible explanation for the weak association involving the suggestions and patents measures is that they reflect different kinds of creative performance: suggestions reflects a routine or adaptive kind of creativity outcome, whereas patents represents a radical or innovative type of creative performance. Submissions to the formal suggestion program were usually detailed, specific suggestions that involved daily work practices. They were more often minor adjustments to existing practices than sources of major changes in product or procedures. Patent disclosures, on the other hand, represented ideas that could make a major change in a product or procedure—ideas the organization wanted to protect its rights in. They were characterized by distinctly different, not simply better, ways of going about the work.

Our results also indicated that supervisors' ratings of creativity are more closely aligned with patents than with suggestions. One possible explanation for this finding is that supervisors' ratings were influenced in one of two ways by their awareness of employees' patent and suggestion contributions. First, supervisors may have given stronger consideration in their ratings to the number of patents generated than to employee suggestions because patents were more highly visible organizational contributions. Second, supervisors may have considered suggestions and patents equally but judged patents as more creative than suggestions. Future research using ratings of creativity should systematically examine these possibilities by asking raters to describe the basis for their creativity ratings.

Future work is also needed to develop a refined and comprehensive set of objective creativity indicators that range from the routine or adaptive to the highly radical or innovative. In addition, work is needed that examines the contributions of personal and contextual characteristics to this set of creativity outcomes. For example, future research might examine the effects of other personal characteristics (e.g., technical skills and cognitive styles) and contextual conditions (e.g., goal-setting programs, financial incentive systems, and interpersonal competition) on various types of creative performance. In addition, research should continue to address the interactive effects of these personal and contextual characteristics on employee creativity.

A second limitation of this study involves the rather low internal consistency reliabilities for some of the measures included in the research. For example, the low reliabilities for job complexity and noncontrolling supervision (.68 and .67) may have reduced the effectiveness of these measures in explaining the creativity outcomes. Work is now needed to develop more reliable measures of these constructs and to investigate their relation to a variety of creativity indicators.

Finally, the results of this research have been discussed as though creativity-relevant personal and organizational characteristics caused employees' creative accomplishments. The current study was, however, cross-sectional, and these assumptions of causality are not technically justified. It is possible, for example, that highly creative performers were placed in more complex jobs and supervised in a more supportive manner in the work units investigated. Moreover, employees' recent creative accomplishments might have affected their responses to the CPS measure.

Longitudinal field studies and controlled field experiments that address the issue of causal direction are now needed. Specifically, longitudinal studies should follow individuals with different CPS scores and from different contexts for a period of time, assessing their creative performance at regular intervals. Field experiments might examine the effects on creative performance of (1) assigning employees with different scores on the CPS index to different positions within an organization and (2) manipulating specific characteristics of the organizational context.

In addition, research is needed that examines the effects of context manipulations on employees' creativity-relevant personal characteristics. Although we treated personal and contextual characteristics as independent constructs and our measures of these constructs made independent contributions to the three creativity indicators (Tables 1–2), our measures of personal characteristics (CPS) and job complexity (MPS) related significantly to one another (Table 1). It may be that employees who scored high on the CPS self-selected into complex jobs or were assigned to such jobs by supervisors. Alternatively, it may be that individuals' scores on the CPS were shaped by their job experiences. Early research by Kohn and Schooler (1978) demonstrated that certain job conditions could substantially influence personal characteristics such as intellectual flexibility. Studies are now needed to investigate whether characteristics of a job and an organizational context affect employees' creativity-relevant personal characteristics.

In conclusion, despite the limitations described in the paragraphs above, this study contributes to a growing literature on individual creativity in organizations and provides support for an interactionist approach. Future practice and research need to further unravel the complex relations among personal characteristics, contextual factors, and a variety of creative outcomes. As this unraveling occurs, organizations may be better able to appreciate their employees' creative potential and to benefit from the implementation of their novel and useful contributions.

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APPENDIX

The items measuring *supportive supervision* included (1) My supervisor helps me solve work-related problems, (2) My supervisor encourages me to develop new skills, (3) My supervisor keeps informed about how employees think and feel about things, (4) My supervisor encourages employees to participate in important decisions, (5) My supervisor praises good work, (6) My supervisor encourages employees to speak up when they disagree with a decision, (7) My supervisor refuses to explain his or her actions (reversed-coded), and (8) My supervisor rewards me for good performance.

The items measuring *noncontrolling supervision* included (1) My supervisor always seems to be around checking on my work (reverse-coded), (2) My supervisor tells me what shall be done and how it shall be done (reverse-coded), (3) My supervisor never gives me a chance to make important decisions on my own (reverse-coded), and (4) My supervisor leaves it up to me to decide how to go about doing my job.

The items measuring *creative performance* included (1) How ORIGINAL and PRACTICAL is this person's work? Original and practical work refers to developing ideas, methods, or products that are both totally unique and especially useful to the organization; (2) How ADAPTIVE and PRACTICAL is this person's work? Adaptive and practical work refers to using existing information or materials to develop ideas, methods, or products that are useful to the organization; and (3) How CREATIVE is this person's work? Creativity refers to the extent to which the employee develops ideas, methods, or products that are both original and useful to the organization.

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DIVERSIFYING ENTRY: SOME EX ANTE EXPLANATIONS FOR POSTENTRY SURVIVAL AND GROWTH

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Links between theoretically determined preentry conditions and the postentry performance of diversifying entries made by large industrial firms are examined. Industry, firm, and relatedness variables explained up to 26 percent of the variance in performance, which was measured as the survival, sales growth, and market share growth of entrant businesses. Selling and advertising intensity in an entered industry, scale of entry, and the interaction of scale and seller concentration have strong influences on postentry performance. Other variables show moderate associations. Overall, industry factors appear to have stronger effects than firm-level or relatedness variables.

Entry by existing firms into new areas of business—diversifying entry—is a topic of much interest to both the business and academic communities. To managers, it is important because in entering a particular industry, they put at risk their firms' resources, which could be profitably employed in alternative investments. Moreover, the success or failure of a new venture can define the character of a firm's operations for years and greatly influence its future growth and profitability (Rumelt, 1986). From the viewpoint of researchers, this topic provides an opportunity to apply several theoretical perspectives rooted in disciplines such as economics, marketing, and management (Biggadike, 1979). Research interest in the diversifying moves of large firms is also piqued by the strategic importance of entry for individual firms and the large numbers of entries made collectively by firms in the United States (Dunne, Roberts, & Samuelson, 1988; Williams, Paez, & Sanders, 1988). Consequently, researchers have explored several issues surrounding this phenomenon. In a seminal study on diversifying entries made by large industrial firms, Biggadike (1979) examined how postentry strategic and operating decisions affected the market performance of entrants. Other research on entry

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has been concerned with the influence of entry barriers on choice of entry mode (Yip, 1982) and with the competitive edge firms gain from being the first to enter emerging industries or subindustries (Lambkin, 1988; Lieberman & Montgomery, 1988; Mitchell, 1991, 1989).

In spite of the extensive writings on entry in both the management and economics literatures, as well as closely related theoretical work delineating antecedents to diversification (cf. Hoskisson & Hitt, 1990), there is relatively little empirical research examining the extent to which preentry conditions influence the postentry performance of diversifying entrants.¹ Since the decision to enter an industry is presumably based on the information currently available to managers, it may be useful to know how the performance of entrant businesses is influenced by conditions existing immediately prior to the time of entry and at that time. In this article, we draw upon three important streams of research to develop a framework predicting how certain theoretically identifiable preentry factors influence the postentry performance of diversifying entrants. First, following research that highlights the importance of industry environment (Rumelt, 1991; Schmalensee, 1985; Sousa, Alberto, & Hambrick, 1989; Wernerfelt & Montgomery, 1989), we argue that initial conditions in the destination industry influence the performance of diversified entrants. We then draw upon previous research to identify a set of industry-level factors that would be expected to influence postentry performance. Second, we invoke the emerging research on competitive dynamics (Chen & MacMillan, 1992; MacMillan, McCaffery, & Van Wijk, 1985) to identify a set of factors that would increase the likelihood of retaliation by incumbents and, hence, adversely affect the performance of entrants. Finally, we review relevant literature on the resource-based view of the firm to present arguments that entrants are likely to perform well in an entered industry when their respective parent firms possess the skills and resources critical for competitiveness vis-à-vis incumbents (Montgomery & Hariharan, 1991; Rumelt, 1986; Wernerfelt, 1984). As is explained later, we followed previous research to measure performance in terms of the postentry survival² and growth of entrant businesses.

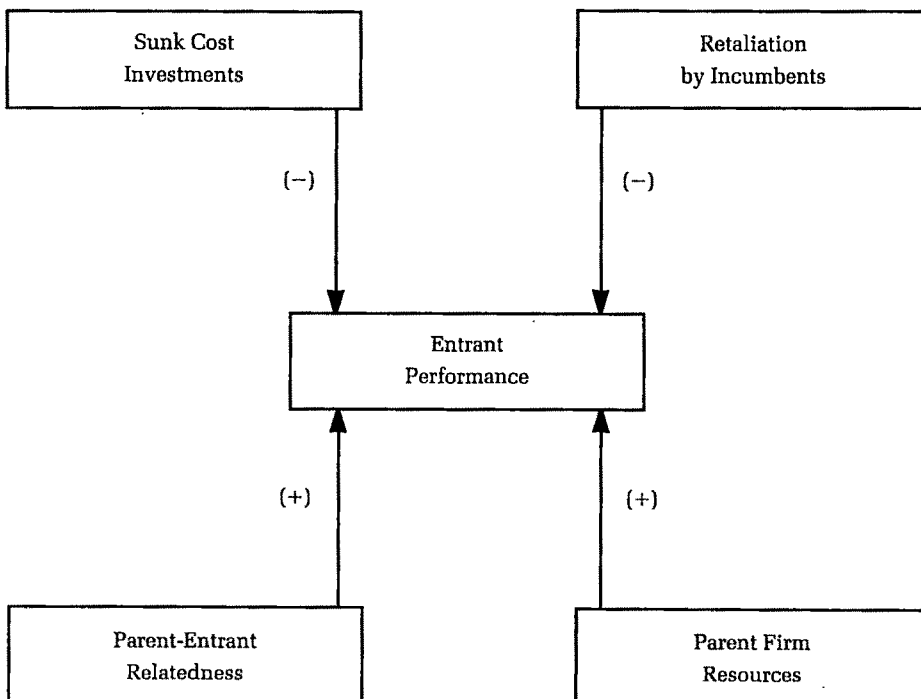
¹ Much of the empirical literature on diversification has been aimed at testing Chandler's (1962) thesis that firms enter industries in which their "core skills" can be fruitfully utilized (e.g., Rumelt, 1986; cf. Ramanujam & Varadarajan, 1989). That stream of research is concerned primarily with the overall resource profile of firms. Research on entry, by contrast, endeavors to capture the change in the firms' diversification postures even as that change is occurring. In other words, the study of entry is a study of diversification at the margin. This shift from the firm to the business level of analysis helps recognize the importance of conditions at the time when operations in the entered industry are begun. Moreover, although most studies on diversification include *all* businesses of firms in their samples, the approach taken here focuses on new businesses of diversifying firms.

² Specifically, we examined how a set of theoretically defined preentry variables influenced postentry survival, measuring survival dichotomously by noting whether or not a particular entrant existed in 1986. Then, we used logistic regression analysis to empirically execute our research.

In effect, we develop our theoretical framework around the conceptualization of structural entry barriers as sunk cost investments that entrants have to make to be competitive vis-à-vis incumbents. We argue that these costs are not borne by all entrants to the same degree. Rather, costs depend on the extent to which incumbents retaliate against an entrant and the extent to which the latter can share costs with other businesses in its parent firm's portfolio. The sunk costs, we argue, increase with retaliation and decrease with resource similarity between the entrant business and the rest of its parent firm. Furthermore, we argue that the degree to which a firm can bear the usually very high cost of sustaining operations in a recently entered industry depends on the resources available to it (see Figure 1).

Hence, the distinctive contribution of this article is to converge three well-established streams of research on a theoretically important and managerially relevant issue that has received little academic scrutiny. We realize it is likely that the performance of diversifying entrants depends on a very large number of factors, ranging from luck and chance to idiosyncratic firm-specific capabilities that cannot be measured. We used our theoretical emphasis, therefore, to bound this analysis with a limited set of measurable factors

FIGURE 1
Theoretical Framework



that have been repeatedly used in strategy research. Thus, this research complements the few attempts there have been (e.g., Biggadike, 1979), to explain the variance in the performance of diversifying entrants. In addition to its theoretical contribution, this research also makes an important methodological contribution. By incorporating multiple dependent variables in a multivariate context and by using an extensive sample that comprises both survivors and nonsurvivors, it provides a unique view into the disaggregated diversification attempts of large industrial firms. In doing so, this study complements and informs the vast literature on corporate diversification (see Hoskisson and Hitt [1990] for a review).

THEORY AND HYPOTHESES

Several empirical studies support the view that industry attributes influence the profitability of businesses (Porter, 1980, 1985). On examining the line-of-business data from the Federal Trade Commission (FTC), for example, Schmalensee (1985) found that industry effects explained about 20 percent of the variance in accounting returns at the line-of-business level. Other researchers who reanalyzed his data have supported his conclusion (Kessides, 1992; Rumelt, 1991). Hansen and Wernerfelt (1989) and Wernerfelt and Montgomery (1989) have also noted an influence of industry context on performance at the firm level. These authors measured the industry membership of multibusiness firms in their respective samples as the sales-weighted average of all industries in which the firms operated.

For an entrant business, industry conditions at the time of entry are likely to be of particular significance for two reasons. First, in order to be competitive in the entered industry, entrants usually have to make nontrivial irrecoverable investments to adequately compete with incumbents. Because these investments may be permanently lost if the firm has to retreat from the entered industry, they are referred to as *sunk costs*, and they are often thought to profoundly affect industry dynamics and firm profitability (cf. Sutton, 1991). It may be useful, therefore, to delineate the initial industry conditions that reflect the nature of these investments and to understand how such structural entry barriers influence entrants' postentry performance. Second, by bringing additional capacity, resources, or both into an entered industry, entrant businesses may threaten the market position and profitability of existing firms. In response, incumbents may retaliate aggressively with the intention of driving out the new entrants (cf. Smiley, 1988). Hence, from the viewpoint of entrants, it may be useful to specify the industry conditions that influence the severity of retaliation by incumbents (i.e., behavioral entry barriers). These aspects of industrial dynamics are elaborated below.

Structural Barriers to Entry

The role and significance of structural entry barriers is best understood using the concepts of fixed and sunk costs developed in the contestability literature (Baumol & Willig, 1981). Fixed costs are operating expenditures that are independent of scale of production and cannot be reduced unless pro-

duction is discontinued altogether. Sunk costs, by contrast, are expenditures that an entrant has to incur to set up shop. These costs are not fully recoverable in the short or intermediate term. Fixed costs are necessary, recurring costs incurred to the same degree by both entrants and incumbents, but sunk costs impose incremental costs on entrants that are not borne by incumbents. The entering firm has to convert liquid capital into frozen assets, whereas the incumbents' funds on this account are already committed and exposed to whatever perils participation in the market entails. This difference between the incremental cost faced by entrants and incumbents results from the need to sink money into a new venture and therefore constitutes a barrier to entry into an industry (Biggadike, 1979; Yip, 1982).³ Entrants have to incur sunk costs both in building production capacity and infrastructure for sales and distribution and in building intangible assets, such as a brand name, via advertising (Kessides, 1992) and process/product know-how, via expenditures in research and development (Grabowski & Mueller, 1978).

Tangible assets. If an entrant is able to successfully enter an industry that requires heavy investments in tangible assets, it may benefit from the potential effectiveness of those assets in blocking competition from further entry (Yip, 1982). Entry into such an industry may, however, be extremely costly and, in the end, be a Pyrrhic victory for the entrant because of the large amount of investments necessary to achieve a market position comparable to incumbents'. It is often argued, for example, that plants of minimum efficient scale (MES) may be necessary for competitiveness in industries in which economies of scale are important. The greater the capital investment required to put in place one or more optimally sized plants, the higher will be the incremental costs new entrants bear (cf. Bain, 1956; Modigliani, 1958).⁴ Similarly, if the norm in the entered industry is to have high selling expenses because of sales force or distribution channels, the entrants will also have to make similar operating expenditures to effectively compete with incumbents

³ In more formal terms, fixed costs are defined as the magnitude $F(w)$ in the long-run total cost function such that $C_L(y, w) = d \times F(w) + V(y, w)$ $\{d = 1$ if $y > 0$, and 0 otherwise $\}$, where $C =$ cost, $L =$ long-term performance, $\text{plim } V(y, w) = V(0, w) = 0$, the variable cost $V(*)$ is nondecreasing in all arguments, and y and w are, respectively, the vectors of output quantities and input prices.

Sunk costs, on the other hand, are defined by Baumol and Willig (1981) as follows: let $C(y, w, s)$ represent the short-run cost function applicable to plans pertaining to the flow of production that occurs s units of time in the future. Then, $K(w, s)$ are the *costs sunk for at least s years*, if $C(y, w, s) = K(w, s) + G(y, w, s)$ and $G(0, w, s) = 0$.

Finally, since in the long run all sunk costs are zero, $\text{plim } K(w, s) = 0$.

⁴ It is possible, however, that even if MES is large, entry may be viable on a small scale unless there is a penalty for operating at a suboptimal scale (Scherer & Ross, 1990). Hence, a better indicator of capital requirements of entry is the interaction between MES and the cost disadvantage ratio, or CDR (Caves, Khalizadeh-Shirazi, & Porter, 1975). CDR is the ratio of value-added per worker in plants that are smaller than MES to that in plants that are larger than MES. The smaller this ratio for a given MES, the greater is the cost disadvantage of smaller plants and the more formidable the investment requirements (Scherer & Ross, 1990).

(Williamson, 1963). In addition, the entrants have to invest in building sales forces or distribution networks so that they have an asset base comparable to that of incumbents. Again, entrants will be at a disadvantage relative to incumbents because of such incremental investments. Hence, *ceteris paribus*,

Hypothesis 1a: The postentry performance of diversifying entrants will be negatively associated with fixed asset intensity in the entered industry.

Hypothesis 1b: The postentry performance of diversifying entrants will be negatively associated with the intensity of selling in the entered industry.

Intangible assets. In some industries, firms often spend large sums of money in advertising to differentiate their products from those of their competitors. Advertising provides useful information about the availability of products and their attributes, enabling consumers to make informed purchase decisions (Cady, 1976). As Galbraith (1967) noted, however, advertising can also be used to manipulate information and to create unreal images without conveying any useful product-related information. In either case, the importance of advertising as a carrier of information, real or image-oriented, cannot be disputed. Expenditures on this score help develop such intangible assets as brand awareness and loyalty (Comanor & Wilson, 1974; Kessides, 1986; Tesler, 1964). Firms that do not advertise their products do so at the risk of losing both visibility and sales. Entrants often need to make expenditures in advertising that are larger than those incumbents make because the latter have the benefit of intangible assets already built over time.⁵ Incumbents do not bear this incremental cost, putting entrants at a disadvantage vis-à-vis the latter (Kessides, 1986). In a similar manner, expenditures in research and development may also be seen as investments in intangible assets that yield positive returns over the long haul (Grabowski & Mueller, 1978). Entrants may have to make expenditures in R&D over and above the levels made by incumbents to develop competitive capabilities for product and process innovations. Once again, these incremental costs, not borne by incumbents, put entrants at a relative disadvantage. It is useful to note that the norm of heavy advertising and research expenditures may reflect a high degree of product differentiation and segmentation (cf. Sutton, 1991). Under such conditions, an entrant may prosper by locating in profitable niches in the entered industry. Still, the weight of the evidence is that the necessity of heavy expenditures in advertising and research is to the disadvantage of new entrants in industries in which incumbents have already built substantial intangible assets. Hence, we predict, *ceteris paribus*,

⁵ It is true that the actual depreciation rates for advertising capital stock may show variation across industries, the actual degree of which is difficult to estimate in a large-sample study such as this. Even so, it is reasonable to assume that industries with norms of intensive advertising campaigns will have incumbents with reputation and goodwill that make it difficult for entrants to switch customers to their products (Gorecki, 1986).

Hypothesis 2a: The postentry performance of diversifying entrants will be negatively associated with the intensity of advertising in the entered industry.

Hypothesis 2b: The postentry performance of diversifying entrants will be negatively associated with the intensity of research and development in the entered industry.

In summary, barriers created by the intended or unintended actions of incumbents provide an environment in which firms can obtain above-average profits without fear that new entrants will erode them (Porter, 1980). For a new entrant, however, these same barriers create adverse competitive conditions and negatively affect their performance.

Competitive Interaction

Even though an excess of revenues over operating costs may enable an entrant to recover sunk cost investments in tangible and intangible assets, there is always a risk that the reaction of incumbents will depress postentry prices or restrict the entrant's sales and make such recovery impossible. By bringing additional capacity or resources into an industry, an entrant may threaten the market position and profitability of the existing firms. The incumbents may in turn actively resist the marketing efforts of new entrants by taking measures such as advertising aggressively, lowering prices, attacking entrants' markets, and so on (Masson & Shaanan, 1982; Smiley, 1988). In other words, retaliation by incumbents is likely to depress the margins obtainable by the entrants, thus putting at even greater risk the sunk cost investments they have already made in the entered industry. Harsh retaliation by incumbents may either induce entrants to quit or force them to endure depressed performance—a Pyrrhic victory of sorts. Hence, potential entrants must also consider factors that influence the severity with which incumbents may retaliate. Drawing on previous research, we identified the following such factors: (1) seller concentration in the entered industry, (2) the scale at which entry is made, (3) the interaction between seller concentration and scale of entry, and (4) the growth of the entered industry.

Research in recent years has greatly expanded academic understanding of the factors that drive the competitive response of incumbents (Chen & MacMillan, 1992; Chen & Miller, 1994; Chen, Smith, & Grimm, 1992; MacMillan, McCaffery, & Van Wijk, 1985). Although this research largely explores the competitive rivalry among incumbent firms, it sheds light on how incumbents may react to new entry. Drawing specifically from the work of Chen and MacMillan (1992), who invoked game theory to explore competitive dynamics, we elaborate below the stated conditions that are likely to influence the severity of regulation against entrants.

Seller concentration. Chen and MacMillan argued that in deciding whether or not to respond to a competitive move, firms "must balance the payoff for not responding against the payoff for doing so. . . . [T]he more Attacker's move affects Defender's key markets, the greater the payoffs in-

volved for Defender. This reasoning suggests that in the absence of actual payoff data, strategy researchers can use competitor dependence as a surrogate [for likelihood of retaliation]" (1992: 545). The researchers made and supported the prediction that the incentive to retaliate harshly against new entrants would be much greater when incumbents have a strong stake in an industry (cf. Dutton & Jackson, 1987). High seller concentration, a situation in which a few incumbents have large market shares, can serve as a proxy for strong industry stake.

It should also be recognized that incumbents' reactions to entry may depend on how the cost of retaliation is shared among them. The incumbent that retaliates against an entrant incurs private costs in acting unilaterally. But if the entrant is eventually forced to exit, all incumbents benefit. A given incumbent may, therefore, prefer not to incur the costs of retaliating. If there are only a few incumbents, they may be able to avoid this free rider problem by coordinating their actions and possibly even sharing the costs of retaliation. That is, high concentration inflates the potential for collusive behavior (Christensen & Montgomery, 1981; Cowley, 1988; Galbraith & Stiles, 1983). In a study of U.S. manufacturing firms, for example, Galbraith and Stiles (1983) found that firm profitability was positively associated with seller concentration in all three types of product markets (components, capital goods, and consumables) that they considered. The researchers anticipated this finding in their theory section, and they attributed it to potential for collusive behavior by incumbents in concentrated industries. Similarly, in a study of chemical-processing industries, Lieberman (1987) found that incumbents coordinated investments in concentrated industries in response to entry but did not do so when other incumbents expanded their capacities. The same conclusion is apparent in a study of five retail and professional industries by Bresnahan and Reiss (1991), who found that prices dropped more slowly in response to entry as the entered markets became less and less concentrated. Hence, it is reasonable to expect that retaliation by incumbents will be more likely when an entered industry is highly concentrated.

In addition to serving as a proxy for dependence and coordination, seller concentration can also reflect the reputation effects entrants may face (Kreps & Wilson, 1982; Shapiro, 1983). By virtue of their history in the industry and consumers' experience with their products, incumbents' claims of quality and reliability are likely to be more credible than those of entrants. We recognize that an entering firm may leverage its reputation in its base industry for greater acceptance in a contiguous entered industry. Even so, a transferred reputation will be measured against that of firms already in the industry. Thus, a parent firm's reputation in its home industry may do the entrant little good if the incumbents are well established. How significant an incumbent firm's reputation capital is can be assessed by the demand for its products—high market share may indicate consumers' confidence in the firm's products. Since the largest firms in an oligopolistic industry have high demand for their goods, it is reasonable to assume that the reputation of

incumbents is a formidable obstacle for entrants when seller concentration is high.

In sum, then, it is likely that entrants will face strong retaliation by incumbents in highly concentrated industries because of (1) a few large incumbents' heavy dependence on the entered industry, (2) greater potential that the few large incumbents will coordinate their actions, and (3) affects of the reputations of well-established incumbents. We, predict, therefore, that, *ceteris paribus*,

Hypothesis 3a: The postentry performance of diversifying entrants will be negatively associated with seller concentration in the entered industry.

Scale of entry. It is also evident from research on competitive rivalry that incumbents are less likely to retaliate aggressively when they sense that an entrant will not back down because of the costs it may have to bear in reversing the entry. Chen and MacMillan, for instance, invoked research in both economics and organization theory to emphasize that "tangible asset-investment components of irreversibility as capacity and capital cost . . . make a competitive move more irreversible than other moves" (1992: 546). When such investments are significant, the argument goes, an entrant may be loathe to back down because of potential inability to recover those investments. Anticipating this, the incumbents may not retaliate strongly but instead accommodate the new entrant. Of course, as the researchers noted social, political, and organizational factors may be as important as economic reasons in determining the degree to which an entrant may consider entry irreversible. "Whatever its source," Chen and MacMillan argued, "The irreversibility of an action can significantly shape competitors' response behavior since it acts as a strong signal of the true type (toughness) of an attacker" (1992: 546). Although there are several indicators of the extent of tangible investment by an entering firm and managerial commitment to the entrant business, perhaps the most easily measurable indicator is the scale at which entry is made. Large-scale entry is often associated with large capital investment, which, in turn, is unlikely without strong managerial commitment to a course of action (cf. Biggadike, 1979). Hence, we expect that large-scale entry will give pause to incumbents, and they will withhold strong retaliation against the entrant in question.

In addition to reflecting commitment and irreversibility, large-scale entry has also been recognized as conferring volume-driven cost advantages on the entrant business. In his seminal study on diversifying entry, for instance, Biggadike (1979) found that large-scale entry facilitated quick attainment of high relative share. Large scale, he explained, accelerated time to profitability by expediting volume gains and reduction in the unit costs of the new business arising from the resulting economies of scale. Hence, cost competitiveness arising from scale may also encourage incumbents to accommodate, rather than retaliate against, new entrants. All of the above theoretical rationales allow us to predict that, *ceteris paribus*,

Hypothesis 3b: The postentry performance of diversifying entrants will be positively associated with the scale of entry.

Seller concentration–scale of entry. Chen and MacMillan predicted and found empirical support for the interaction between dependence and irreversibility. They noted that “when an attacker has made a highly irreversible move in a market that is very important to a defender, it becomes crucial for the defender to signal a willingness to fight, even if the attacker has signaled a willingness to play tough” (1992: 547). In other words, entry made at a small scale may be less visible and threatening to incumbents because of its marginal impact on their market position, and such entries may, therefore, avoid retaliation. Large-scale entry into a highly concentrated industry, however, is likely to upset the industry’s structure and directly challenge firms that have a substantial stake in the market. Large incumbents would then retaliate to preserve their market positions, inducing large-scale entrants to exit or sustain depressed performance. Hence, we expect, *ceteris paribus*,

Hypothesis 3c: The postentry performance of diversifying entrants will be negative when made on a large scale in highly concentrated industries.

The important distinction between this reasoning and that presented in developing Hypothesis 3b should be noted. Although large scale does help an entrant become cost competitive, as we previously argued, it can also threaten the market position of well-established incumbents and invite retaliation from them. This is particularly likely in highly concentrated or oligopolistic industries in which the few incumbents have high stakes and can possibly, if tacitly, coordinate their responses to entry. Hence, although we expect scale to be positively associated with postentry performance, we predict a negative association between the two variables when the entered industry is highly concentrated. Whether volume-driven cost advantages are sufficient to compensate for the negative consequences of retaliation is an empirical question that we addressed in our regression analysis.

Industry growth. In addition to seller concentration, scale of entry, and the interaction between the two, the severity of incumbents’ retaliation against new entrants is also likely to be influenced by the rate of growth of the entered industry. High industry growth rate creates unfilled demand so that the additional output brought in by entrants may not expose the incumbents to price cuts or “hanging capacity.” That is, new entry under conditions of expanding demand is less threatening even to those incumbents who have a high stake in the industry and, therefore, less likely to invite severe retaliation. Additionally, a rapidly growing industry also erodes the advantages of assets in place (e.g., distribution systems) that are designed for incumbents’ existing market positions. Consequently, rapid industry growth is likely to turn incumbents’ attention away from entrants toward catching up with expanding demand (Hause & Du Rietz, 1984). Both these reasons have the effect of reducing their incentives to strongly retaliate against new

entrants (McDonald, 1986; Orr, 1974). Hence, we hypothesize that, *ceteris paribus*,

Hypothesis 3d: The postentry performance of diversifying entrants will be positively associated with industry growth rate.

Parent-Entrant Relatedness

Although the above industry factors influence postentry performance via requirements for sunk cost investments or inducing retaliation by incumbents, it is important to note that they are not equally formidable for all entrants. Competitive advantage may accrue to diversifying entrants if they exploit synergies with other businesses within their parent firms (Ansoff, 1965; Hines, 1957) at both corporate and business levels (Grant, 1988; Porter, 1987; Rumelt, 1982).

Resource similarity. An emerging body of research suggests that the performance of an entrant will be enhanced if it requires for success the managerial skills and attitudes available within the parent firm (Grant, 1988). As Mahoney and Pandian (1992) noted in their essay on the resource-based view of the firm, managerial know-how and abilities are important sources of competitive advantage. Following Penrose (1959), the authors go on to say that it is not physical resources per se but the managerial ability to make good use of those resources that leads to a superior competitive position. Consequently, they noted, the resources and skills available to firms greatly influence the direction in which they chose to diversify. Two theoretical rationales within the resource-based view of the firm have emerged in recent years: (1) *dominant logic* and (2) *center of gravity*. Prahalad and Bettis suggested that the key individuals composing the top management team of a firm often share a common "mind set or world view or conceptualization of the business and the administrative tools to accomplish goals and make decisions" (1986: 491). This mind-set, or dominant general management logic, is rooted in the problems the top managers have encountered and the skills they have acquired over time while managing the firm's other businesses, particularly its largest, or core, business. In the context of a diversifying entry by an established firm, then, it is likely that it gains an advantage if the skills required for the critical tasks in the new venture are compatible with the dominant logic of the firm. Such compatibility permits greater sharing of management expertise between the parent and the entrant and perhaps even induces greater commitment to the new business by the firm's top management (Harrison, Hall, & Nargundkar, 1993).

Similar, though not identical, arguments have been made by Galbraith and Kazanjian (1986), who proposed the concept of center of gravity. They drew on the notion of the value-added industry supply chain and suggested that the issues faced and lessons learned by the managers of a diversified firm are very much a function of the stage of the supply chain that the firm considers its home base. The basic idea they present is that stage in the supply chain determines, to a large extent, the "organizational structure,

management processes, dominant functions, succession paths, and management beliefs and values—in short, the management way of life” (Galbraith & Kazanjian, 1986: 54). The center of gravity provides a mind-set and specific administrative skills that can easily be applied in other businesses at the same stage of the supply chain in different industries. Once again, in the context of diversifying entry, the closer an entrant is to its parent’s center of gravity, the greater is its potential for obtaining management expertise and commitment from the corporate office.

Both dominant logic and center of gravity arguments highlight the importance of the similarity between the functional orientation of the entered industry and the functional expertise of the parent firm, or the “*relative distance between the knowledge needed to operate in the new domain and the degree of knowledge available in the current domain*” (Kazanjian & Drazin, 1987: 347; italics in original). This argument has its roots in the concept of absorptive capacity, according to which learning in a new domain (or the capacity to absorb new ideas) is facilitated by knowledge in contiguous areas (Cohen & Levinthal, 1990). Functional similarity, in other words, involves sharing the management expertise available in a firm with businesses in the newly entered domains. Such similarity is largely intangible. As Porter noted, “Intangible interrelationships lead to competitive advantage through transference of *generic skills* or know-how about how to manage a particular type of activity from one business unit to another” (1985: 324; italics in original). Absent such interrelationship, the effectiveness of knowledge transference through consultations and executive transfers is reduced. Harrison, Hall, and Nargundkar (1993) presented some evidence for such a transfer of know-how, reporting higher performance for firms with similar research and development intensity across their lines of business. In addition, several empirical studies at both industry and firm levels have shown that diversifying firms are more likely to enter industries in which the functional experiences gained in their home industries can be fruitfully applied (Lemlin, 1982; McDonald, 1985; Montgomery & Hariharan, 1991; Scott, 1982; Scott & Pascoe, 1987; Stewart, Harris, & Carleton, 1984). These researchers have argued that the ease with which a firm can enter an industry and the postentry performance of the entrant business depend on the degree to which its parent has experience in managing activities that are important for success in the new environment. In a given entry situation, certain types of experiences available to the entering firm can help it quickly overcome competitive disadvantages. If incumbents’ strength in advertising-related activities is an impediment, for example, firms with a history of heavy advertising can leverage their expertise to build comparable market position in the entered industry. These arguments, which are in keeping with much of the literature on the resource-based view of the firm (Wernerfelt, 1984), highlight the value of the skills and resources that an entering firm may bring into the entered industry.

There may be a different side to the functional similarity between an entering firm and an entered industry, however. According to an alternative view, the competitive position of an entrant may be strengthened when it

brings different but complementary skills to an industry. This argument derives from research by Barney (1988), who, in trying to explain mixed research support for the relatedness hypothesis in the context of mergers and acquisitions (e.g., Lubatkin, 1987), argued that synergy may be necessary but not sufficient to ensure that acquiring firms obtain value. A high degree of relatedness may invite competitive bids (i.e., auction), the argument goes, and lead to excessive payment by the eventual acquirer, which would in turn lead to "winner's curse" when the acquiring firm is unable to recoup the investment it has made in the transaction. Consequently, Barney (1988) argued that greater value is created when acquiring and acquired firms bring complementary skills and resources to a merger. Harrison, Hitt, Hoskisson, and Ireland (1991) tested this proposition, demonstrating a positive association between postmerger return on assets and differences in the premerger resource allocations (to building functional skills) of acquiring and target firms. Although the authors were not addressing entry per se, it is plausible that similar effects obtain during entry into new industries. An entering firm may be able to gain competitive advantage over incumbents by leveraging key skills that are not widespread in the entered industry. Firms with a history of heavy advertising, for instance, may be able to leverage their expertise to build strong market positions in industries in which advertising is relatively low key.

We therefore have two opposing viewpoints regarding the effects of functional similarity on the postentry performance of entrant businesses. The theoretical arguments we have developed suggest, however, that it is important for an entering firm to have resources similar to those needed in an entered industry. Such similarity allows the entrant to rapidly acquire new skills that are closely related to those that its parent already has and to therefore benefit from knowledge transfer and top management commitment. Conversely, when the functional orientation of the entered industry and functional expertise of the parent firm are substantially dissimilar, the entrant business would be poorly positioned to obtain the skills necessary to effectively compete with incumbents. Hence, we predict, *ceteris paribus*,

Hypothesis 4a: The postentry performance of diversifying entrants will be negatively associated with the degree of functional dissimilarity between their parent firms and entered industries.

Product Relatedness

In addition to leveraging intangible skill and resources, it is also likely that an entrant business will benefit from sharing tangible resources or product-level relatedness with other businesses within its parent firm (Porter, 1985). Although empirical evidence is mixed on this score (Keats, 1990; Reed & Luffman, 1986), the discrepancies are partly traceable to differences in methodologies and perspectives (Hoskisson & Hitt, 1990; Nayyar, 1992) and partly a result of difficulty in implementing well-formulated diversification strategies (Hill, Hitt, & Hoskisson, 1992). It has been argued, for instance,

that entrant businesses may be unable to exploit product relatedness with parent firms because of difficulties in coordinating their operations with corporate-wide systems and procedures (e.g., Smith & Cooper, 1988; Sykes, 1986). Still, there remains the potential to exploit economies of scale and scope between related businesses (Panzar & Willig, 1981; Teece, 1980). As Porter noted, "The failure of synergy [in practice] stemmed from the inability of companies to understand and implement it, not because of some basic flaw in the concept" (1985: 318). In the context of this research, therefore, we argue that an entrant business benefits from sharing tangible resources with its parent firm's other businesses (Biggadike, 1979). Hence, we expect that higher relatedness between entrant businesses and their respective parent firms will result in greater potential for sharing tangible resources in areas such as procurement and production. This sharing is in turn likely to enhance the cost and competitive positions of entrants and to improve their postentry performance. We predict, *ceteris paribus*,

Hypothesis 4b: The postentry performance of diversifying entrants will be positively associated with the degree of their product relatedness with their parent firms.

Control variables. In addition to industry and relatedness factors, variables commonly used by researchers to characterize entering firms and their entrant businesses were also included in our analysis. Several studies have reported the effects of firm- or corporate-level variables on the performance of business units (Kessides, 1992; Rumelt, 1991; Schmalensee, 1985; Wernerfelt & Montgomery, 1989). Although there is some controversy as to the extent of influence membership in a corporation has on the performance of a business, there is growing evidence that it is not trivial. Brush (1996), for example, showed that the operational synergies available from membership in a corporation do indeed have a significant influence on the performance of business units. He reported that a change in ownership (i.e., acquisition) of a business unit was associated with improved competitive performance. This result has also been reported by Ravenscraft and Scherer (1991), who, in a study of divisional sell-offs, noted that the divested units performed better under the new ownership.

There is growing empirical support for the view that the size and the nature of resources available to an entrant from its parent influences its postentry performance. From studies of entry into four-digit Standard Industrial Classification (SIC) code manufacturing industries, Berry (1975) and Gorecki (1975), among others, have shown that many conventional barriers to entry are less applicable to existing corporations than to new entrepreneurial firms. At least part of the reason for this seems to be that entrant businesses of existing firms have access to resources with which to sustain the severe financial losses that are almost inevitable in the first few years after entry (Biggadike, 1979). This argument has been supported in a study by Smith and Cooper (1988), who, upon examining entry into rapidly growing industries, found that the parents of the entrants achieving the highest market shares

were larger and had greater financial resources. They reasoned that the viability of an entrant business is greatly enhanced if it has access to the financial and other resources necessary to build a competitive market position in its initial years. Hence, we expected that parent size and liquidity would be positively associated with the performance of entrants.

Another important factor is the nature of a parent firm's organizational infrastructure, which influences an entrant's ability to exploit synergies with other businesses in the parent's portfolio. Most businesses need support activities, such as financial, legal, and accounting services and human resources management, during the course of their operations. To the extent that a parent firm has the systems and personnel to provide these services from a central corporate location, an entrant business is likely to be able to leverage these for enhanced operational effectiveness. Perhaps the best *a priori* indicator of the presence of such infrastructure at the level of the parent firm is its overall diversity (Smith & Cooper, 1988; Yip, 1982). High diversity indicates a firm's experience in managing disparate businesses and suggests that a new business venture will be able to use support activities in a cost-effective manner. We expected, therefore, that parent firm diversity would be positively associated with the performance of entrant businesses.

Finally, as Yip (1982) noted, entrants can bypass the need to build competitive capabilities from the ground up by acquiring existing businesses. This is so because the acquired businesses already have intangible assets, such as industry-specific reputation, brand name, and product and process know-how. Still, acquisitive entry may impose hidden incremental risks and costs on the diversifying firm. It is possible that because of information asymmetry in the market for acquisitions, an acquiring firm may not know the true value of its target. Thus, the acquirer may agree to excessive premiums for the investment, thereby exposing itself to adverse selection (Akerlof, 1970). This overpayment may negatively affect performance or even threaten the survival of the newly acquired business (Harrison et al., 1991). Moreover, as several scholars have observed, there are significant costs associated with integrating an acquired business into the acquiring firm's corporate structure and systems (Jemison & Sitkin, 1986; Haspeslagh & Jemison, 1990). Such costs are incremental because the incumbents in the entered industry do not have to make comparable expenditures. Since the net effect of exploitable synergies and incremental costs of integration is difficult to predict *a priori*, we included mode of entry as a control variable in our regressions.

METHODS

The first critical consideration in studying diversifying entries was to have a workable definition of the terms *industry* and *entry*. To this end, we adopted commonly used four-digit Standard Industrial Classification (SIC) codes as the working definition of industry. This choice offered at least two advantages for the research issue at hand. First, we could easily identify diversifying entries for a particular firm by noting changes in four-digit SIC codes over a predefined period. Second, because the use of such codes has

precedents in the literature (Montgomery, 1979), this definition allows the results of this research to be put in the context of previous work in related areas such as corporate diversification.

Sample

Selection. Diversifying entries made between 1980 and 1982 by *Fortune* 500 firms were chosen as the working sample for this study. We obtained industry information at the four-digit level for each firm from the Trinet "large establishment files." This database is a uniquely comprehensive source of line-of-business (four-digit SIC) information and has been used extensively in research on diversification-related topics (e.g., Bethel & Liebeskind, 1993; Brush, 1996; Chatterjee & Blocker, 1992; Markides, 1995; Markides & Williamson, 1994; Montgomery & Wernerfelt, 1988; Wernerfelt & Montgomery, 1989). We discuss key attributes of Trinet, as well its strengths and weaknesses, in the Appendix.

We used two rules to cull entries for the final sample. First, it was possible that Trinet might record the presence of a firm in an industry in 1982 but miss it in 1980 because of the firm's small size. Thus, we removed from the database all the smallest establishments that cumulatively accounted for 1 percent of total industry output (Dunne, Roberts, & Samuelson, 1988). Second, we excluded all entries whose entered industry was identified as a catch-all category (SIC codes xxx9 and 6711). The resulting sample comprised 739 businesses entered by 216 firms that were ongoing as of 1986. Compared with the other 284 corporations in the originally sampled *Fortune* 500, the 216 firms with entrants in the final sample had larger sales ($t = 2.94, p < .004$) and assets ($t = 3.21, p < .002$). There was, however, no statistical difference between the two groups of firms in terms of their preentry performance measured as return on assets (ROA; $t = 1.64, p < .101$), return on sales (ROS; $t = 0.99, p < .324$), and return on investment (ROI; $t = 1.39, p < .164$).

Further scrutiny of the data revealed that 379 entries in the final sample were made into the manufacturing sector. Since data on the industry variables discussed in the Theory section were available only for manufacturing businesses, we tested hypotheses on the subsample of 379 manufacturing entries. Even so, the key descriptive statistics for the full sample were similar to those of the manufacturing subsample.

Key characteristics. Several aspects of the data on entry during the 1980–82 period are noteworthy. First, the average scale of entry was \$46 million for the full sample and \$54 million for entries into the manufacturing sector (see Table 1). These represented 0.9 and 1.1 percent, respectively, of the average sales of the parent firms. The median scale of entry was even smaller, at a respective 0.3 and 0.4 percent for the two groups. Second, the cumulative size of all entries made by a sample firm represented, on average, less than 2 percent of their sales for both groups (Table 1). The median cumulative sales from entries was less than or equal to 0.5 percent. These statistics suggest that although the entrant businesses generated sales of several million dollars, they made a modest contribution to the overall revenues of their parent firms.

TABLE 1
Scale of Entry^a

Variables	All Entries	Manufacturing Entries
Mean scale of entry	45.97	53.51
Median scale of entry	8.20	9.90
Mean scale of entry/mean firm size	0.9%	1.1%
Median scale of entry/median firm size	0.3%	0.4%
Mean ^b	1.7%	1.9%
Median ^b	0.4%	0.5%

^a Scale figures represent millions of dollars.

^b All new sales from entry/firm size.

Another noteworthy aspect of the data is that 54 percent of all entries and 48 percent of manufacturing entries had less than \$10 million in sales. Entries over \$25 million represented 25 and 26 percent, respectively, of the total number of entries for the two groups. The average number of entries made by firms during the 1980–82 period was 3.34 per firm for all entries and 2.44 for entries into the manufacturing sector. These figures imply once again that although the diversifying firms made several entries within a short period, a large proportion of these were at a relatively small scale. Perhaps the most striking feature of the data was that, by 1986, 58 percent (431) of all entrants had ceased to be part of the business portfolios of their parent firms. In other words, a large proportion of diversifying entries did not survive beyond a few years after entry. This point is examined in detail in the Discussion section.

A Note on Performance

Postentry survival, growth in sales, and market share were used in this research to evaluate the performance of entrant businesses (Biggadike, 1979; Yip, 1982). We used these variables because, unlike incumbents, entrants are likely to be primarily concerned with survival and long-term viability. As newcomers to an industry, they must invest in industry-specific assets to build a sufficiently large volume of sales and name recognition (Biggadike, 1979). Only after viability is secured by having a critical level of sales and market share will the desired returns to investment follow. As Biggadike noted, "Given the fairly short time horizon of most managers and directors, it seems likely that financial performance is emphasized prematurely. . . . [T]he key point is that whereas share is a factor explaining satisfactory ROI for established businesses, it is an *objective* for entrant businesses" (1979: 88–89; italic in original). Even so, the growth criteria are only applicable for businesses that continue to operate in the entered industry. Sales and market share are meaningless for those that cease operations; in such cases, the duration of participation in the entered industry is important. Hence, another important criteria for evaluating postentry performance of diversifying entrants is whether or not they survived a given number of years (Mitchell,

1989). In short, diversifying entries were evaluated by examining (1) how the survivors as of 1986 differed from the nonsurvivors, and (2) the sales and market share gains achieved by the surviving entrant businesses.

We expected the independent variables to similarly influence both the survival and growth measures of performance. All else being equal, it is likely that fast-growing entrant businesses will have a high chance of being retained by their parent firms and that those retained will have to respond to internal pressures to grow fast (cf. Burgelman, 1983). Unfortunately, there is little theoretical or empirical guidance to help us evaluate how these dependent variables will be differentially influenced by the same set of independent variables. This is either because previous studies have studied only survivors (e.g., Biggadike, 1979), or because market share, not survival, was the critical issue for the sample under investigation (e.g., Lambkin, 1988; Williams, Tsai, & Day, 1991). Even so, we cannot rule out the possibility that some entrants may be able to survive at a small scale, and it is plausible that niche play in a highly differentiated and segmented industry will enable survival without much growth (cf. Carroll, 1985; Sutton, 1991). It is conceivable that survival is more likely in industries with high R&D and advertising intensity but that the growth of surviving entrants is lower in such industries because of a high degree of segmentation and high mobility barriers (cf. Caves & Porter, 1977; Geroski, 1991). Given the lack of theoretical or empirical precedents, however, these are only speculations to be verified and explored in our empirical analysis. We attend to these issues again in the Discussion section.

Measurement of Variables

Survival was measured as a dichotomous variable with a value of 0 if the parent firm exited from the entered industry between 1982 and 1986 and 1 if it remained in the industry as of 1986. *Sales growth* was measured as the growth over four years [(sales at t_2 /sales at t_0)], where t_2 was the year (1986) in which entrants' performance was evaluated and t_0 was the first year (1982) in which the sales of the entrant businesses were available in Trinet. *Market share growth* was computed as market share at t_2 over market share at t_0 . The data for these variables were derived from Trinet.⁶

⁶ Note that, as discussed in the Appendix, Trinet does not actually report sales and market share data but estimates them by multiplying the number of employees reported by average shipments per employee (from industry census data). That is, each manufacturing plant of entering firms in our sample is assumed to have the *average* labor productivity of all plants in corresponding industries that are in the same size classification (productivity numbers in census data are adjusted for the size of the plant). It is difficult to say, however, whether entrants as a group are more or less productive than the average incumbent in an entered industry. Although resolving this issue is outside the scope of this article, we acknowledge that this feature of Trinet may be a shortcoming. Additionally, the availability of Trinet tapes at two-year intervals limits our ability to pinpoint the exact year in which entry occurred—although we can say with certainty that entries in our sample occurred between 1980 and 1982. We acknowledge, therefore, that this limitation of the data may influence the measures of sales and market share growth in an unknown way. We thank the reviewers for bringing these two points to our attention.

Industry growth rate was computed as industry shipments in 1982 over industry shipments in 1977. The source for these data was the *Census of Manufacturers*. *Seller concentration* was measured as the combined market shares of the top four firms in the destination industry. The data on this variable were obtained from the *Census of Manufacturers*. As in the case of the other industry variables, data for concentration were available for manufacturing industries only.

Advertising intensity was advertising expenditures per unit of sales in the destination industry. Similarly, *research and development intensity* was measured as R&D expenditures per unit of sales in the destination industry. Finally, *selling intensity* was the selling and distribution expenses per unit of sales in the destination industry. The data for these three variables were obtained for the year 1977 from the Federal Trade Commission's Line-of-Business report (FTC-ALB).⁷

Industry asset intensity was calculated as minimum efficient scale (MES) multiplied by the cost disadvantage ratio (CDR) as suggested by Caves, Khali-zadeh-Shirazi, and Porter (1975). We measured MES as the median plant size in the industry and obtained CDR by dividing sales per employee for the plants in the third quartile (PQ3) by size with sales per employee for plants in the first quartile (PQ1) (*industry asset intensity* = $MES \times CDR$, where $CDR = PQ3/PQ1$). The data were derived from Trinet.

Following Montgomery and Hariharan (1991) and Harrison et al. (1991), we measured *functional dissimilarity* as the difference in advertising, R&D, and fixed asset intensity between entered industry and entering firm. As argued previously, similar intensity levels in these three areas reflect the possible sharing of expertise between the firm and its entrant business in the new industry. We therefore measured this variable as the absolute difference, with respect to each of the three areas, between the firms' activity level and the activity level in the entered industry. Thus, functional relationship was measured as $|Firm_f - Industry_f|$, where f represents functional intensity.

⁷ Although researchers often use firm-level data from COMPUSTAT to measure industry-level variables, this practice is not without problems. The industry-level advertising ratios, for example, would be obtained from COMPUSTAT by aggregating the variable across the firms reported to be in a given industry. A problem arises in using this, however, because COMPUSTAT assigns multibusiness firms to a single industry for recording convenience. Hence, the alternative source was used for the purpose of this study. The FTC-ALB attempts to specifically break down expenditures in different functions by line of business and has several additional attractive features (Ravenscraft, 1983). Many researchers have used it to measure expense-to-sales ratios (e.g., Brush, 1996; Montgomery & Hariharan, 1991). Hence, we used the expense-to-sales ratios from FTC-ALB for industries in our sample. Note, however, that since FTC-ALB covered only the 1974-77 period, we used the 1977 data to measure functional intensity variables prior to entry in 1980. Although using ratios precludes problems attributable to inflation, using 1977 data could be a problem if the relative ranking of industries changed in terms of expense ratios. We therefore recognize that there is a trade-off between using COMPUSTAT for timeliness and FTC-ALB for clarity (Brush, 1996). In this article, we prefer the latter.

The functional intensity levels for both the entering firm and the entered industry were computed as follows: (1) advertising expenditures/sales, (2) R&D expenditures/sales, and (3) fixed assets/sales. It should be noted that, as indicated in Hypothesis 4a, we expected the functional dissimilarity variables to be negatively associated with performance because a larger absolute value of the difference indicates greater dissimilarity between a firm and an entered industry. The data used to compute functional dissimilarity variables were obtained from FTC-ALB, COMPUSTAT, and Trinet.

Product relatedness was measured as the relatedness between an entrant business and the other business of its parent firm. We computed it using the following modified version of the concentric diversification index (Caves, Porter, & Spence, 1980): $product\ relatedness = (P_{kl} \times d_{il})$, where P_{kl} is the percentage of firm k 's sales that are in industry l and d_{il} is a weight whose value depends upon the distance between the entered industry i and the other industries l in which the parent has operations. Values of d_{il} were 2, if i and l were within the same three-digit SIC code, 1, if i and l were within the same two-digit SIC, and 0, if i and l were in different two-digit SIC industries.

Larger values of d_{il} indicate greater product relatedness. It should be noted that the above measure computes not the overall relatedness of firms, but only the relatedness between the entrant business and all the other industries in which its parent had sales at the time the diversifying entry was made. The data for this variable were obtained from Trinet.

Scale of entry was measured as the dollar sales made during an entrant's first year of operations. Following Duhaime and Baird (1987) and Bergh (1995), we also measured scale as entrant sales divided by the total sales of its parent. These authors make the argument that relative size is important because it reflects the degree of "psychological investment" (Duhaime & Baird, 1987: 486) a parent firm has in the entered business. The data for both measures were obtained from Trinet.

Finally, we measured each of the four control variables as follows: (1) *Firm size* was the total sales of entrants' parent firms averaged over the three years prior to 1982. (2) *Firm liquidity* was the parent firms' average working-capital-to-sales ratios for the three years prior to the year in which entry was made. The data for these two variables were obtained from COMPUSTAT. (3) *Firm diversity* was computed with Jacquemin and Berry's (1979) entropy measure for total diversification: $diversity = \sum P_{kl} \ln (1/P_{kl})$, where P_{kl} is the percentage of firm k 's sales in industry l . (4) *Mode of entry* was a dummy variable with 1 representing acquisitive and 0 otherwise. The data required to compute these two measures were obtained from Trinet.

The operational definitions of all variables and their respective data sources are summarized in Table 2.

RESULTS

Table 3 presents the Pearson correlations. For the multivariate regression analyses, we constructed two working samples. First, when using survival

TABLE 2
Measurement of Variables

Description	Measurement	Source ^a
Performance variables		
Survival	Entrant surviving in 1986 = 1, other = 0	Trinet
Sales growth	Entrant sales, 1986/entrant sales, 1982	Trinet
Market share growth	Entrant market share, 1986/entrant market share, 1982	Trinet
Explanatory variables		
Industry asset intensity	Industry asset expenditure/industry sales	Trinet
Industry selling intensity	Industry selling expenditure/industry sales	FTC-ALB
Industry advertising intensity	Industry advertising expenditure/industry sales	FTC-ALB
Industry R&D intensity	Industry R&D expenditure/industry sales	FTC-ALB
Seller concentration	Sum of market share of four largest competitors—C4	Census
Scale of entry	Entrant business sales in 1982	Trinet
Industry growth rate	Shipments, 1982/shipments, 1977	Census
Advertising dissimilarity	Absolute value of difference between advertising/sales ratios for entered industry and entering firm	COMPUSTAT/ FTC-ALB
R&D dissimilarity	Absolute value of difference between R&D/sales ratios for entered industry and entering firm	COMPUSTAT/ FTC-ALB
Asset dissimilarity	Absolute value of difference between fixed assets/sales ratios for entered industry and entering firm	COMPUSTAT/ FTC-ALB
Product relatedness	Sales-weighted distance from entrant to each of the other businesses of parent	Trinet
Control variables		
Firm size	Average sales, 1978–80	COMPUSTAT
Firm liquidity	Working capital/firm sales, 1980	COMPUSTAT
Firm diversity	Entropy measure	Trinet
Acquisitive entry	Entry via acquisition = 1, other = 0.	Trinet

^a Trinet = Trinet large establishment files (1980–1986); Census = *Census of Manufacturers* (1980); and FTC-ALB = line-of-business data, Federal Trade Commission (1977).

as the dependent variable, we considered all diversifying entries made into manufacturing industries by sample firms. Second, for sales and market share growth as the dependent variables, we included in our analyses a subset of the full sample that comprised only those entries that survived until 1986. For comparability, we used the same specifications across all regression equations. Table 4 presents a summary of the results for all multivariate regressions across the three dependent variables.

Overview of Results

Several results appearing in Table 4 are noteworthy. Hypothesis 1a did not receive support: Fixed asset intensity in the entered industry was not

TABLE 3
Pearson Correlations

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Industry asset intensity	11.00	18.00															
2. Industry selling intensity	0.08	0.05	-.01														
3. Industry advertising intensity	0.02	0.03	.03	.40**													
4. Industry R&D intensity	0.03	0.05	.12*	.05	-.06												
5. Seller concentration	35.00	19.00	.28**	.04	.17**	.35**											
6. Scale of entry	54.00	311.00	.75**	-.07	-.03	-.04	.04										
7. Concentration X scale	0.74	2.32	.34**	-.11*	.03	.01	.27**	.46**									
8. Industry sales growth	1.56	0.48	.21**	.46**	.08	.44**	.14**	.05	-.06								
9. Advertising dissimilarity	0.03	0.04	.00	.26**	.75**	-.02	.10	-.03	.14†	.06							
10. R&D dissimilarity	0.03	0.05	.11†	-.08	-.06	.93**	.28**	-.01	.03	.31**	.00						
11. Asset dissimilarity	0.30	0.42	.02	-.07	-.05	-.01	.00	.04	.20**	-.06	-.10	.05					
12. Product relatedness	17.00	30.00	.03	.02	.21**	.03	.18	-.03	.13*	-.06	.23**	.04	-.13*				
13. Firm size	4,972.00	9,372.00	.11*	-.05	-.07	.08	.11	.06	-.07	-.02	-.18*	.06	-.09	-.07			
14. Firm liquidity	0.18	0.15	-.03	.09	.19**	.03	-.03	-.05	.00	.06	.27**	.00	-.13*	.07	-.21		
15. Firm diversity	213.00	76.00	-.04	.01	-.07	-.02	-.04	-.02	-.03	-.01	-.22**	.01	.16**	-.16**	.02	-.02	
16. Acquisitive entry	0.51	0.50	-.07	.01	.08	-.18**	-.13*	.05	.02	-.16**	.03	.10**	.21**	-.07	-.13*	.00	.06

† $p < .10$ * $p < .05$ ** $p < .01$

TABLE 4
Summary of Results

Variable	Hypothesis	Expected Sign	Results by Performance Variable			Overall Result
			Survival	Sales Growth	Market Share Growth	
Entered industry						
Industry asset intensity	1a	-	n.s.	n.s.	n.s.	No support
Industry selling intensity	1b	-	-	-	-	Strong support
Industry advertising intensity	2a	-	+	+	+	Strong contradiction
Industry R&D intensity	2b	-	n.s.	n.s.	n.s.	No support
Seller concentration	3a	-	n.s.	+	n.s.	Moderate contradiction
Concentration \times scale	3c	-	-	-	-	Strong support
Industry growth rate	3d	+	n.s.	n.s.	-	Mild contradiction
Parent-entrant relatedness						
Advertising dissimilarity	4a	-	n.s.	-	-	Moderate support
R&D dissimilarity	4a	-	n.s.	n.s.	n.s.	No support
Asset dissimilarity	4a	-	n.s.	n.s.	n.s.	No support
Product relatedness	4b	+	n.s.	n.s.	n.s.	No support
Other						
Scale of entry	3b	+	+	+	+	Strong support
Controls						
Firm size	+	+	n.s.	n.s.	n.s.	No support
Firm liquidity	+	+	n.s.	+	+	Moderate support
Firm diversity	+	+	n.s.	n.s.	n.s.	No support
Acquisitive entry	0	0	n.s.	n.s.	n.s.	No relationship
Pseudo R^2 (best fit)			0.25			
Adjusted R^2 (best fit)				0.26	0.20	
Overall significance			.001	.017	.054	
Highest significance level			.027	.040	.133	
Lowest significance level						

negatively associated with postentry performance. Hypothesis 1b was supported, however. Selling intensity was negative and significant in all three models, although its effect on postentry sales and market share growth wore off when functional relationship measures were included in the regressions. This finding indicates that the high selling costs necessary to break into the distribution and sales infrastructures of incumbents may be formidable obstacles for entrants. Hypothesis 2a was contradicted. Contrary to expectation, intensity of advertising was positive and significant in all three models. This finding suggests that the norm of high advertising expenditures in the entered industries enables the entrant business to not only become viable in the short run, but also to build market positions immediately following entry. Hypothesis 2b was not supported. R&D intensity in the entered industry did not significantly decrease the performance of entrants. Hypothesis 3a was partially contradicted. Although seller concentration in the entered industry was not statistically associated with survival or market share growth, it was positive and marginally associated with postentry sales gain. Hypothesis 3b was supported. Scale of entry was positive and statistically significant in all three types of model,⁸ suggesting that the scale of entry influences the exit or stay decision and also facilitates postentry growth. Hypothesis 3c was supported. As predicted, the interaction term (concentration by scale) was negative and significant for all three dependent variables. That is, large-scale entries into concentrated industries were more likely to be reversed within the first few years and, if not, these entries lost sales and market share during that period. Hypothesis 3d was contradicted in the model for market share, where industry sales growth was found to be negative and marginally associated with postentry market share gain by entrants. It was not statistically significant in other models. Hypothesis 4a was partially supported. Advertising relationship had a statistically significant, negative influence on postentry sales and market share. Other functional relationships were not statistically associated with postentry performance. Hypothesis 4b was not supported.

With respect to the control variables, we found that firm-level variables were not significant in the exit models, although firm size and liquidity were positive and marginally significant in some of the sales growth and market share models. Although the size and liquidity of firms did not appear to influence a firm's decision to stay in or exit from recently entered industries, it seemed to enable higher postentry sales and market share growth rates for the entrant businesses that did survive the first few years. Presumably, the entrant businesses of cash-rich firms have ready access to the funds needed to build initial market positions (Biggadike, 1979; Smith & Cooper, 1988).

⁸ This result was unchanged when the alternate measure for scale (i.e., relative size, per Duhaime and Baird [1987]) was used in the logistic regressions. Across different specifications, the coefficient for this alternative measure of scale remained negatively significant. This was not true, however, when we used relative size as an alternate measure of scale in the regressions for sales and market share growth. This measure of the scale variable was nonsignificant in these regressions.

Mode of entry was marginally significant in two of the sales growth specifications, but it was nonsignificant in all the other regression equations, indicating that acquisitive entrants as a group did not perform better in terms of either survival or growth.

Results by Each Dependent Variable

Table 5 presents the results of logistic regression analyses testing the influence of independent variables on the probability of survival as of 1986. Table 6 and 7 respectively present the results of multivariate regressions examining postentry sales and market share growth, measured as multiples of sales and market share as of 1982, the year in which entry was noted. Since this measurement depresses the growth rates of entries made at a large scale, it is plausible that the standard ordinary-least-squares (OLS) regression assumption of a common disturbance variance at all observation points (i.e., homoskedasticity) is violated. The presence of heteroskedasticity in the regression, if not accounted for, would lead to amplified variance of the parameter estimates, and the conventional tests would no longer have asymptotic justification (Johnston, 1984). We therefore adjusted each regression model for sales or share growth by first computing an asymptotic covariance matrix of estimates assuming heteroskedasticity and then using the consistent standard errors to calculate a revised *t*-statistic for each variable in the model.⁹ In addition, we also recognized that since scale of entry is a choice variable for entering firms, it may be endogenous. We therefore did a Hausman's test for endogeneity. The test was negative ($m = 0.037$, n.s.), and we could not reject the null hypothesis that scale and error terms are uncorrelated since scale was not endogenous. Because of missing values for functional relationship variables, the number of observations in the fully specified regression equations drops markedly.

All four specifications presented in Table 5 are statistically significant at the level of $p < .027$ or better. The pseudo R^2 values range from 14 percent for model 1 to 25 percent for models 3 and 4. Several results from these analyses are worth highlighting. First, advertising and selling intensities in the entered industries were significant across all the specifications. Interestingly, although selling intensity had a negative sign as expected, advertising intensity had an unexpected positive sign. That is, Hypothesis 1b was supported, but Hypothesis 2a was contradicted, suggesting that the probability of entrant businesses' survival was negatively related to the intensity of selling expenditures and positively associated to advertising intensity in the entered industries. Second, Hypothesis 3b was supported: Scale of entry was positively associated with survival. Third, Hypothesis 3c was supported. The

⁹ We also evaluated the results of the regression analyses for potential degradation through outliers, multicollinearity, or both. The results were not contaminated by outliers, although multicollinearity between industry R&D intensity and R&D relationship was a problem. Since neither variable was significant in any of the models, multicollinearity was deemed not to affect the basic results of the regression analyses.

TABLE 5
Results of Logistic Regression Analysis for Survival

Variable	Model 1			Model 2			Model 3			Model 4		
	b	Wald χ^2		b	Wald χ^2		b	Wald χ^2		b	Wald χ^2	
Industry asset intensity	-0.017	0.54		-0.019	0.45		-0.011	0.12		-0.011	0.11	
Industry selling intensity	-9.664	6.73**		-7.880	2.85†		-14.196	6.08*		-14.192	6.02*	
Industry advertising intensity	10.222	4.85*		21.083	4.52*		26.273	6.26*		26.276	6.25*	
Industry R&D intensity	-4.039	1.81		-1.167	0.10		14.552	1.58		14.556	1.57	
Industry sales growth	0.214	0.39		-0.252	0.25		-0.307	0.29		-0.308	0.29	
Seller concentration	0.004	0.20		0.030	3.51†		0.021	1.60		0.021	1.60	
Concentration \times scale	-0.000	4.71*		-0.001	5.00*		-0.001	5.03*		-0.001	5.02*	
Product relatedness	0.007	2.13		0.005	0.45		0.001	0.02		0.001	0.02	
Advertising dissimilarity				-12.481	1.75		-11.014	1.32		-11.013	1.32	
R&D dissimilarity							-17.427	2.07		-17.431	2.07	
Asset dissimilarity										0.009	0.00	
Firm size	-0.000	1.37		-0.000	0.06		-0.000	0.07		-0.000	0.07	
Firm liquidity	-1.167	1.12		1.102	0.15		0.674	0.05		0.681	0.05	
Firm diversity	0.002	1.01		0.003	1.89		0.004	2.55		0.004	2.45	
Scale of entry	0.019	6.15*		0.050	6.37*		0.051	6.57*		0.051	6.56*	
Acquisitive entry	-0.360	2.01		-0.100	0.07		-0.084	0.04		-0.084	0.04	
Intercept	-0.315	0.21		-1.779	2.95†		-1.186	1.16		-1.189	1.01	
Restricted log likelihood	-203.552			-105.288			-96.804			-96.804		
Unrestricted log likelihood	-186.363			-92.336			-82.013			-82.013		
Pseudo R^2 ^a	0.14			0.20			0.25			0.25		
χ^2	34.378			25.905			29.582			29.582		
Overall significance	0.001			0.027			0.014			0.020		
n	306			164			150			150		

^a Pseudo $R^2 = \{[1 - (Lr/Lu)]^{(2/N)} / [1 - (Lr) / (2N)]\}$, where Lr and Lu are restricted and unrestricted likelihoods, respectively, and N is the number of observations in the model.

† $p < .10$

* $p < .05$

** $p < .01$

TABLE 6
Results of Multiple Regression Analysis for Sales Growth^a

Variable	Model 1		Model 2		Model 3		Model 4	
	b	t	b	t	b	t	b	t
Industry asset intensity	0.001	0.05	-0.148	-1.51	-0.090	-0.78	-0.106	-0.80
Industry selling intensity	-21.365	-2.04*	-6.335	-0.44	7.676	0.28	9.898	0.36
Industry advertising intensity	49.873	1.62	129.004	2.17*	157.045	2.46*	160.173	2.42**
Industry R&D intensity	-11.825	-1.49	-7.282	-0.60	81.108	1.29	84.843	1.35
Industry sales growth	-1.082	-0.75	-3.293	-1.38	-4.934	-1.58	-5.056	-1.61
Seller concentration	0.043	1.37	0.162	2.52**	0.152	2.04*	0.146	1.99*
Concentration \times scale	-0.000	-1.59	-0.002	-2.21*	-0.002	-2.16*	-0.002	-2.12*
Product relatedness	-0.007	-0.35	-0.021	-0.70	-0.023	-0.60	-0.022	-0.60
Advertising dissimilarity			-92.706	-1.69†	-126.533	-2.04*	-129.305	-2.02*
R&D dissimilarity					-92.397	-1.48	-96.904	-1.55
Asset dissimilarity							2.162	0.44
Firm size	0.000	1.51	0.000	1.59	0.000	1.73†	0.000	1.80†
Firm liquidity	12.431	1.91†	15.858	1.50	18.451	1.57	20.847	1.51
Firm diversity	-0.006	-1.05	-0.012	-1.38	-0.015	-1.23	-0.014	-1.15
Scale of entry	0.005	1.44	0.066	2.32*	0.067	2.24*	0.067	2.22*
Acquisitive entry	-0.188	-0.16	-2.387	-1.37	-3.211	-1.75†	-3.295	-1.78†
Intercept	2.498	0.97	4.493	1.21	6.330	1.53	5.569	1.23
R^2	0.185		0.416		0.465		0.467	
Adjusted R^2	0.087		0.234		0.264		0.248	
F	1.881		2.285		2.318		2.132	
Overall significance	0.040		0.018		0.017		0.027	
n	122		60		56		56	

^a t-statistics corrected for heteroskedasticity.

† $p < .10$

* $p < .05$

** $p < .01$

TABLE 7
Results of Multiple Regression Analysis for Market Share^a

Variable	Model 1			Model 2			Model 3			Model 4		
	b	t		b	t		b	t		b	t	
Industry asset intensity	0.019	1.28		-0.108	-1.23		-0.070	-0.72		-0.090	-0.80	
Industry selling intensity	-16.156	-2.22*		-4.509	-0.37		12.626	0.58		15.420	0.65	
Industry advertising intensity	34.642	1.72†		95.591	2.53**		113.458	2.66**		117.391	2.67**	
Industry R&D intensity	-4.743	-1.18		2.035	0.34		57.408	1.22		62.103	1.32	
Industry sales growth	-1.948	-1.55		-4.424	-1.82†		-5.761	-1.88†		-5.914	-1.89†	
Seller concentration	0.021	0.83		0.098	1.53		0.103	1.36		0.096	1.35	
Concentration × scale	-0.000	-2.09*		-0.001	-1.94†		-0.001	-1.98*		-0.001	-1.91	
Product relatedness	-0.012	-0.77		-0.024	-1.05		-0.029	-0.99		-0.029	-1.01	
Advertising dissimilarity				-70.658	-2.01*		-98.177	-2.38*		-101.662	-2.38*	
R&D dissimilarity							-57.401	-1.24		-63.068	-1.36	
Asset dissimilarity										2.718	0.66	
Firm size	0.000	1.36		0.000	1.11		0.000	1.29		0.000	1.46	
Firm liquidity	10.297	2.14*		12.223	1.53		15.171	1.66†		18.183	1.61	
Firm diversity	-0.005	-1.09		-0.007	-0.96		-0.008	-0.78		-0.007	-0.65	
Scale of entry	0.005	1.84†		0.046	1.96*		0.045	1.97*		0.044	1.96*	
Acquisitive entry	0.135	0.16		-1.479	-1.16		-1.842	-1.43		-1.948	-1.46	
Intercept	4.172	2.37**		7.315	2.59**		7.519	2.42**		6.561	1.79†	
R ²	0.152			0.365			0.416			0.420		
Adjusted R ²	0.050			0.168			0.196			0.182		
F	1.490			1.849			1.896			1.766		
Overall significance	0.133			0.060			0.054			0.074		
n	122			60			56			56		

^a *t*-statistics corrected for heteroskedasticity.

interaction between scale of entry and seller concentration was negatively associated with survival. No other hypothesis was supported for this dependent variable.

All four specifications for sales growth (models 1–4, Table 6) are significant at the level of $p < .04$ or better. The adjusted R^2 values range from about 8.7 percent for model 1 to 26.4 percent for model 3. The first specification for market share growth (model 1, Table 7) is not significant at the level of $p < .10$, but the other three (models 2–4) are significant at $p < .07$ or better. The adjusted R^2 values range from about 5 percent for model 1 to 19.6 percent for model 3.

Several results from these regression analyses are also noteworthy. Hypothesis 1a was not supported. As in the logistic regressions for survival (Table 4), Hypothesis 1b was partially supported. Selling intensity was negative and highly significant in the first specification, but it was not significant in the latter three variations of the models. Again as in the logistic regressions, Hypothesis 2a was contradicted. Advertising intensity in the entered industry was positive and significant. Hypothesis 2b was not supported. R&D intensity was not significant. Hypothesis 3a was not supported for market share growth and was contradicted for sales growth. Contrary to expectation, seller concentration was positively and significantly associated with postentry sales growth. As in the logistic regressions, Hypothesis 3b was supported. Scale of entry was positively associated with both sales and market share gains. Again, as in the logistic regressions for survival, Hypothesis 3c was supported. Concentration by scale was negative and statistically significant. Hypothesis 3d was not supported for sales growth, and it was contradicted for share growth. Industry sales growth was negative and marginally significant in market share growth models. Hypothesis 4a was partially supported. As expected, advertising relationship was negatively and significantly associated with sales and market share growth, although other indicators of functional relationship were not statistically significant. Hypothesis 4b was not supported. Finally, with respect to the control variables, the coefficients for firm size and liquidity were positive and marginally significant for some of the specifications for sales and share growth. Mode of entry and other firm variables were not significant.

Overall, regression analyses revealed that the selling and advertising intensities in an entered industry and the scale of entry (particularly when interacted with the seller concentration) were significantly associated with the postentry performance of diversifying entrants. Other variables, such as seller concentration, industry growth, and advertising relationship, were influential in analyses for sales and share growth but were not when survival was the dependent variable.

DISCUSSION

In addition to confirming several individual hypotheses, the regression analyses also supported our basic assertion that the postentry performance of diversifying entries would be systematically associated with preentry in-

dustry, relatedness, and firm-level factors. Identifiable initial conditions explain a nontrivial proportion of the variance in the survival and postentry sales growth of entrants. Overall, the regressions show moderately strong industry effect but weak influences of relatedness and firm-level (control) variables.

This is one of the few studies since Biggadike (1979) to systematically examine the sparsely researched subject of diversifying entry. It differs from previous works in combining multiple theoretical perspectives to shed light on entry and also in its use of three dependent variables in a multivariate context with an extensive sample that includes both survivors and nonsurvivors. Key findings are discussed below.

One interesting empirical regularity seen in the analyses is the strong and positive association between advertising intensity in the entered industry and all three postentry performance variables. This result, although weakly anticipated, is somewhat surprising since it conflicts with the conventional wisdom that high advertising expenditures by incumbents bar potential entry. Rather, an industry norm of high advertising appears to facilitate entrants' survival and growth rates. There are several possible reasons for this seemingly contradictory finding. First, it is plausible that the existing infrastructure for advertising enables entrants to reach consumers in target markets, thereby gaining visibility that would not be possible otherwise (Benham, 1972). If so, firms contemplating diversification should seriously consider targeting industries that have high advertising expenditures. It should be kept in mind, however, that the advertising relationship was negatively associated with performance. Hence, firms that have little or no experience with advertising are likely to be at a disadvantage when entering advertising-intensive industries. The second possible reason for the unexpected sign on advertising intensity may lie in the dynamics of the entered industries. It is plausible that a high advertising-expenditure-to-sales ratio in an entered industry is the result of heavy advertising by large incumbents but little or no advertising by many small competitors (Sutton, 1991). The many small competitors that do not advertise thrive in highly specialized niches, and they may present a model of competition for new entrants to emulate. In other words, entrants may be able to survive by taking refuge in stable niches of highly advertised, highly segmented industries. Moreover, their postentry sales and market share growth may depend not so much on the characteristics of the larger four-digit industry but on the growth rates and competitive conditions in these specialized niches.

Two other contradictory findings need elaboration. First, the positive association between seller concentration and postentry sales gain was surprising since incumbents in oligopolistic industries were expected to retaliate against entrants. Since a large number of entrants in this sample were very small, it is plausible that they actually avoided scrutiny from incumbents and, in fact, benefited from the price umbrella that large firms presumably maintain in concentrated industries. This possibility is indicated by the negative performance of large-scale entrants in concentrated industries. The

other contradictory finding was the negative association of industry sales growth with market share gain. This finding was unanticipated because incumbents in fast-growing industries were expected to accommodate entrants. Perhaps incumbents in growing industries do indeed accommodate entrants, but it is not enough. Stiff competition among entrant businesses may more than compensate for accommodation by incumbents because too many aspiring entrants see fast-growing industries as good business opportunities (Aaker & Day, 1986).

Among the other important findings of this research is the confirmation of the importance of scale of entry, which was positively associated with the survival of entrants during the years immediately following entry (Biggadike, 1979; Yip, 1982). Results indicate that small-scale entry is more likely to be reversed than entry on a large scale. Interestingly, however, a large-scale entry was less likely to survive when the entered industry was highly concentrated. This finding suggests that too small a scale of entry may adversely affect survival by inhibiting efficiency in operations, but too large a scale of entry may attract attention in tight oligopolies and invite defensive retaliation from incumbents. Unfortunately, it is hard to be more precise regarding the scale at which entry ought to be made, except that entry with too little or too heavy a commitment is not without peril.

The positive association of firm liquidity with sales and market share gains reflects the importance of access to resources for the expenditures necessary to attain competitive viability in an entered industry. But the lack of significance of firm size and diversity may indicate large firms' bureaucratic inertia or difficulty in coordinating the actions of existing and entrant businesses.

The nonsignificance of product relatedness was unexpected. Perhaps, as Smith and Cooper (1988) and Willard and Cooper (1985) suggested, firms are too slow or are unable to effectively coordinate the activities of their new businesses with those of existing businesses. The bureaucratic costs accompanying new entrant businesses may neutralize the economic benefits anticipated from relatedness (cf. Jones & Hill, 1988). Interestingly, Harrison and colleagues (1991) also examined the relatedness issue and found that mergers in which acquiring and acquired firms were in related industries did more poorly than those in which the two firms were in unrelated industries. They theorized that merging firms that are seemingly unrelated may actually have complementary resources that bring a great deal of value to the combination. Although Harrison and colleagues' study was in a slightly different context than ours, it highlights the point that relatedness by itself is not enough to result in strong performance (cf. Barney, 1988). This conclusion is supportive of our empirical result.

It is also possible, however, that we did not find that product relatedness influenced performance because the Trinet data used to measure relatedness give no indication of firms' perceptions of or intentions for entrants' relatedness with other businesses. Moreover, the nature of the data is such that it is not possible to know how strategic or central a particular entrant business

was to its parent firm. Thus, our product relatedness measure may be too broad to capture the sharing of specific tangible resources or the strategic centrality of an entrant business. We suggest, therefore, that future researchers further explore this issue by using finer-grained measures that take into consideration managers' perceptions and intentions of product relatedness. An example of this type of research was done by Biggadike (1979), who found that the performance of entrants was associated with type of relatedness, with those leveraging parent firms' marketing capabilities doing the best.

Finally, consistent with our expectation, both survival and growth measures of postentry performance were similarly associated with the independent variables. As is evident in Table 4, in all but two cases each independent variable influenced the three dependent variables in the same direction. The two minor exceptions were as follows. First, although the coefficient for industry growth was nonsignificant in the case of survival and sales growth, it was negative and marginally significant in regressions with market share growth as the dependent variable. One possible explanation for this is that the competitive intensity at the fringes of a rapidly growing industry negatively affects the market share of new entrants, but it does not negatively influence survival or sales growth because the environment is munificent. Second, although the coefficient for advertising dissimilarity was nonsignificant in the case of survival, it was negative and significant when sales or market share growth was the dependent variable. This pattern suggests that although entry into an advertising-intensive industry by a non-advertising-intense firm hinders growth, it does not necessarily induce the new entrant to exit. As we considered earlier, it is plausible that high advertising intensity indicates high industry segmentation, which enables the entrant to locate in a niche that offers protection from competition but limited opportunity for growth. Even as both these exceptions help extract interesting insights, however, our overall results reveal a great deal of similarity across the three dependent variables. We hope our results provide the impetus for further exploration of how survival and growth measures of postentry performance are similarly or differently influenced by the same set of antecedents.

Aside from the demonstrated association between preentry conditions and postentry performance, another significant contribution of this research is in a key characteristic of the entry data. The unexpectedly high rate of exit was surprising and indicative of the poor odds that entrants face in the years immediately following entry (Biggadike, 1979). Below, we note some reasons for the large numbers of exits reported in this article, and we also discuss implications of this feature of the data for research in corporate strategy.

Alternative Explanations for Exit

There are five possible reasons why the studied firms quickly withdrew from recently entered industries. First, the high rates of exit may be the result of diversifying firms' selling their successful entrant businesses to raise cash. We explored this possibility by dividing all entries that survived as of 1984

into two groups: one composed of those that exited between 1984 and 1986, and the other of those that survived at least until 1986. We found that nonsurviving entrants had much smaller sales ($t = 2.54, p < .012$) and weaker market shares ($t = 1.55, p < .12$) than the survivors in 1984. In other words, weaker rather than stronger entrants were nonsurvivors, and the above possibility was therefore rejected.

The second possible explanation for exit is that the sample firms may have made entries largely in response to finite windows of opportunity in the entered industries. This explanation is reminiscent of the "hit-and-run" entry idea expounded in the contestability literature. According to this view, an entering firm has a short-run objective of making a quick profit and then costlessly exiting before the window closes, perhaps as a result of delayed, but lethal, retaliation by incumbents. It is doubtful, however, that this is an appropriate explanation for the patterns observed in our data. First, the unhindered mobility of assets assumed in the contestability literature and necessary for this alternative explanation is untenable both theoretically and practically (Dixit, 1992a, 1992b; Georski, Gilbert, & Jacquemin, 1990). Second, since finite windows impose constraints exogenous to entrants' abilities (Geroski, 1991), the survival of all entrants to a given industry should be equally affected. Yet, for the set of industries into which ten or more sample firms made diversifying entries, some entrants exited within the first two years, some during the next two years, and some stayed on beyond 1986. These staggered exits would not have been observed if the same window of opportunity existed for all potential hit-and-run opportunists. Hence, we also reject this explanation.

A third possible reason for exits from recently entered industries is that they resulted from restructuring undertaken by their parent firms. To test this idea, we gathered information from *Predicast's F&S Index of Corporate Change* about restructuring activity during the 1982–86 period and incorporated this information in a supplementary logistic analysis to examine the relationship between restructuring and probability of exit. No statistical association was found between the two variables in either a univariate (Wald $\chi^2 = 1.23$, n.s.) or a multivariate (Wald $\chi^2 = .52$, n.s.) context.

A fourth possible explanation for the low survival rate of diversifying entrants may be hubris. Perhaps superior performance in their firm's core businesses leads managers to overestimate their ability to compete in entered industries. Once entry is made, however, the true nature of competition becomes evident, and firms quickly withdraw. To explore this possibility, we examined whether the 1980 profitability of entering firms was systematically related to the number of entries they made during the period 1980–82. We found a positive association between the two ($t = 2.15, p < .05$), although the adjusted R^2 was small at 1.41 percent. This finding suggests that profitable firms had a tendency to make more entries, although many other factors influenced this behavior. Interestingly, we also found that the parent firms of nonsurvivors had, on the average, higher operating profitability in 1980 than the parent firms of surviving entrants. So profitable firms made a greater

number of diversifying entries but also withdrew more readily from the entered industries. Unfortunately, because financial information was not available for each entry, we are unable to examine what specific effect hubris may have had on postentry performance. Following Barney (1988), we acknowledge the possibility that private information held by managers may have revealed unique advantages in particular industries and therefore encouraged firms to actively pursue specific opportunities to make diversifying entries. Still, we cannot rule out the possibility that hubris may have led firms to overpay when making acquisitive entries and consequently resulted in winner's curse for the diversifying firms (Roll, 1986).

Finally, as Geroski (1991) speculated, firms may make tentative forays into new industries to learn by experience the intricacies of operating in unfamiliar industries. It is possible, he argues, that firms are aware of the uncertainty associated with operating in new environments all along but, being risk-prone, enter anyway to gather information and to gain practical experience. According to Geroski, entry is "a type of market research conducted at the most practical level possible. . . . [T]he immediate post-entry period is, then, likely to be a period of learning in which those entrants who reveal themselves to be efficient will be selected as survivors" (1991: 283). This view may have credence given that a large number (an average 3.59 per firm) of entries were made on a small scale (approximately 50 percent at less than \$10 million), and a large proportion (58%) of entries were reversed within a few years. It may be that the high mortality observed in the data is a consequence of trial under fire, followed by a corrective withdrawal. Many organizations, after all, continuously push their boundaries to find new applications for their current resources or to tap into opportunities in their environments (Chandler, 1962). These forays into new industries are often made under great uncertainty, and they are inherently risky. Still, this explanation is a speculation on our part since we cannot make definitive inferences about intentions with the archival database used in this study.

LIMITATIONS AND OPPORTUNITIES FOR FUTURE RESEARCH

Although this study makes several important contributions to the literature and has valuable implications for practice, it is not without limitations. Perhaps its first shortcoming is our decision to equate diversifying entry with the appearance of a new four-digit SIC code in a firm's portfolio. This rule has many strengths, the most obvious of which is that it facilitated empirical execution of this research. Moreover, this way of defining industry relies on readily available data and is generally accepted and frequently used throughout the literature. But though appropriate and convenient, this measure may be too broad to capture the detail and richness that are presumably associated with the diversification phenomenon. In other words, although the four-digit SIC codes used in the present study are appropriate for uncovering broad empirical regularities pertaining to diversifying entry, there are substantive unresolved issues when an "inside-out" managerial perspective is adopted. The data and the results presented here are very much in the

aggregate. As mentioned in the introduction, this article does not explore idiosyncratic firm-specific capabilities that may influence entry behavior and performance (Barney, 1988). Because our analysis explains at most only 26 percent of variance, there is a significant amount of unexplored territory it does not cover. Hence, the broad evidence (e.g., industry attributes, relatedness, and firm characteristics) presented here should be followed up with more involved methodologies such as field interviews and surveys.

Some limitations of this project emanate from the Trinet "large establishment files" used to obtain line-of-business information. Although this database is one of the most comprehensive available, and its use has precedents in the literature, the business-level data it reports could not be corroborated with other publicly available sources.¹⁰ Future research should attempt to independently evaluate the accuracy of Trinet. In addition, we were limited to exploring entry into domestic industries and to doing that for only *de novo* and acquisitive modes of entry because Trinet only covers U.S. establishments and does not allow identification of increasingly popular and relatively less risky approaches such as licensing, strategic alliances, and joint ventures. These alternative modes of entry need attention in future research. Finally, since Trinet data files were not available beyond 1988 and because the SIC codes were revised in 1987, this study of diversifying entry is limited to a six-year window of 1980 through 1986 (entry recorded during 1980–82 and performance evaluated as of 1986). Naturally, use of this time-frame raises the question of the generalizability of results to the business environment of the 1990s, which is arguably different from that in the early 1980s. Still, it is important to recognize that the phenomenon of diversifying entry is likely to endure for the foreseeable future. The business press is replete with reports about existing firms diversifying or intending to extend their operations beyond their traditional businesses. Current efforts by American Airlines, for example, to diversify away from the airline business into areas such as information services are now well known (*Wall Street Journal*, 1993: 1). Entry by Southwestern Bell Corporation, a telephone company, into the cable television business is yet another indication that the subject of diversifying entry is interesting beyond the six-year window examined here.

Another limitation of this research is our focus on preentry industry attributes, relatedness variables, and parent firm characteristics. The *a priori* rationale for choosing these factors was that they account for up to 30 percent of the variance in performance at the line-of-business level for ongoing businesses. The explained variance in this research did indeed range from 6 to 23 percent, depending upon the performance variable used. Naturally, many

¹⁰ We made an effort to corroborate the entry information generated from Trinet with similar information obtained from *America's Corporate Families*, the *Billion Dollar Directory*. When we examined it in detail, however, we found the latter source to be incomplete and very unreliable. Consequently, we abandoned the attempt to corroborate. Any limitations of Trinet, therefore, are carried over to the results of this project.

other influences on the postentry performance of diversifying entrants remain to be explored. Factors such as the quality of the products offered, the breadth of the product line, strategic commitment to the new business, and the competence of the managers leading entry do undoubtedly influence performance. Implementation issues such as organizational structure and strategic control systems are also likely to be important (e.g., Hill et al., 1992). All these factors need to be incorporated in future works.

Finally, although the data suggest that a large number of entries were reversed within their first four years, there is no adequate understanding of the factors that induce managers to make up their minds so quickly. The literature on divestiture may be helpful on this score (e.g., Hoskisson & Johnson, 1992; Hoskisson, Johnson, & Moesel, 1994; Markides, 1992; Ravenscraft & Scherer, 1991). In an analysis of a structural model incorporating both governance and strategy variables, for example, Hoskisson and colleagues (1994) found that governance constructs influenced divestment activity (i.e., exit) indirectly through factors such as relative product diversification, leverage, and R&D spending. Similarly, Hoskisson and Johnson reported that "[d]ivestments often follow mixed corporate strategies that create organizational and control inefficiencies in managing both related and unrelated types of business" (1992: 625). It is important to recognize, however, that these studies primarily concern the ongoing businesses within the portfolios of firms and that different factors may influence decisions to exit recently entered industries. For instance, some researchers have cited poor profitability as a reason for exit through divestment (e.g., Ravenscraft & Scherer, 1991). Yet profitability may be an inadequate explanation for quick exit from recently entered industries because entrants typically take more than a few years to show positive profits (Biggadike, 1979). Hence, we think there is a significant research opportunity to explore how and why decisions are made to exit recently entered product markets.

The many remaining research opportunities notwithstanding, this research makes several important contributions to the sparsely explored, yet important, subject of diversifying entry. We have drawn upon and contributed to the extensive strategy literature on diversification and to the sparse but expanding research on entry, which has heretofore been largely in the domain of industrial organization economics. We have made these contributions by bringing three well-established theoretical perspectives together to examine diversification at the level of individual attempts. We have theoretically argued and found empirical support for the link between the initial conditions surrounding and the subsequent performance of entries—a link that is a useful one for both academics and practitioners. For academics, it provides an important set of results that will serve as the grounds for further theory building and for future research into the intricacies of entry and exit. The empirical regularities seen in this large-sample study will, we hope, provide a starting point for more exhaustive exploration of diversification through complementary methodologies such as survey and field interviews. Our results will also be valuable to practitioners because they expose a set

of variables that, at the margin, could influence the outcome of diversification attempts.

In addition to making theoretical contributions, this study also brings value through employing a unique sample constructed from plant-level data. Among the most intriguing observations that this sample made possible was the patterns of entry and exit, which revealed a considerable degree of activity at the periphery of some large industrial firms in the sample. The multiple entries on a small scale and the rapid exits within a few years after entry suggest these firms' continual attempts to extend organizational boundaries, a kind of churning of businesses that may profoundly affect and gradually change the fundamental character of large firms.

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APPENDIX

Trinet staff generate data by directly contacting the physical locations, or establishments, where goods and services are produced. These contacts are made to verify the business name, address, city, state, zip code, county, parent company, number of employees, and goods or services produced. Then, using the SIC manual published by the Division of Management and Budget, Trinet assigns a single four-digit SIC code to the primary good or service produced at each location. If more than one type of good or service is produced at the same location, Trinet creates a separate record for and assigns a location number to each product that is judged as representing a significant portion of the company's total sales. Each location is then assigned a single four-digit SIC code that represents the product or service in question. The location numbers are very useful for research in that they allow each establishment to be tracked over time—a feature that enabled us to identify and evaluate diversifying entries. Trinet then estimates the sales for each SIC from the information regarding employment and line of business. This is done as follows. First, the shipments-per-employee are estimated for each four-digit code by combining the information on total industry employment with the industry shipments (in dollars) reported by the Department of Commerce. It is important to note that Trinet uses different average shipment/employee numbers for different sizes of establishments. Second, these shipment-per-employee figures are applied to the establishment-level employment figures (obtained by direct telephone contact once a year) to estimate sales for each line of business. Third, sales for each line of business are added up for each location and then aggregated up to the level of the parent firm. Finally, the company-level sales so calculated are reconciled with the publicly available sales figures. If a company also reports revenues by individual divisions or business units, Trinet uses these figures as the basis for estimating the company sales at the SIC code or line-of-business level. In the case of private firms, company-wide employment figures are obtained by directly contacting the head office. If discrepancies are found, Trinet adjusts the computed company sales figures to more closely agree with the numbers reported at the firm level.

In short, Trinet uses well-established routines in its data collection efforts. These include: (1) telephonically updating the data on each establishment on an ongoing basis, (2) reconciling

the information obtained from an establishment with a wide range of public sources, and (3) verifying the accuracy of the data input procedures. The company estimates that its databases cover 90–95 percent of establishments with 20 or more employees in manufacturing industries and 70–80 percent of those in the service sector of the U.S. economy. In addition, Trinet reports a 92 percent correlation between its figures and FTC figures for the sales of the top four companies in over 900 four-digit SIC codes.

Three constraints come with using Trinet files (Davis & Duhaime, 1992). First, since the data tapes were only available for alternate years, observations on entry and postentry performance could be made only at two-year intervals. Second, the 1987 change in the SIC code structure constrained the time period under study to between 1980 and 1986. Third, the shipments from each establishment Trinet reports are not the actual figures provided by the parent company but estimates based on average productivity numbers by plant size. Finally, because Trinet does not allow identification of strategic alliances or joint ventures, the analyses related to mode of entry were restricted to those where entry was achieved by acquisition, building capacity from the ground up, and a mix of these two modes. Even so, the level of disaggregation, wide coverage, precedents, and reliability of Trinet allowed us to examine an important, yet largely ignored, aspect of corporate diversification.

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FOREIGN SUBSIDIARY COMPENSATION STRATEGY: AN AGENCY THEORY PERSPECTIVE

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This study extends agency theory to explain the design of compensation strategy in foreign subsidiaries competing within global industries. Results from 100 subsidiaries in five countries indicate that compensation strategy is influenced by the agency problem, defined by the subsidiary's cultural distance from its headquarters market, lateral centralization, and senior management's commitment to the parent. In addition, the association between the overall design of the compensation strategy and perceived subsidiary effectiveness was examined. An incentive structure aligned to the agency state was positively related to subsidiary effectiveness.

Top management compensation is recognized as an important mechanism linking managerial behavior to organizational outcomes, particularly to outcomes desired by a firm's stakeholders. Although studies examining compensation strategy have traditionally focused on corporation-level influences, understanding the influence of administrative systems at lower organizational levels is of central concern to strategy researchers in as much as competitive advantage is defined at the business unit, or profit center level (Fisher & Govindarajan, 1992). Recognizing the need to expand the focus of compensation research, the authors of recent studies have begun examining the reward structures associated with competitive advantage at the subunit level (Balkin & Gomez-Mejia, 1987; Fisher & Govindarajan, 1992; Galbraith & Merrill, 1991).

In addition, as Balkin and Gomez-Mejia (1987) noted, the contingencies or conditions under which different reward structures may be more or less appropriate are not well understood. Concerning the management of multinational corporations, a dramatic change in the extent of integration and coordination of activities occurring on a worldwide basis is resulting in very different industry conditions. Prior to this industry globalization, a multinational

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could view its subsidiaries from essentially a portfolio perspective. Although transfers of tangible and intangible assets necessarily occurred to support foreign subsidiaries, each subsidiary was focused predominantly on local-country markets. Correspondingly, the primary concern of a foreign subsidiary's manager was the performance of the subsidiary in its local market. However, globalization is resulting in a significant redefinition of the role of the subsidiary manager as subsidiaries become more tightly integrated with other subunits within corporations. The subsidiary manager remains accountable for market or country-based performance but must increasingly be concerned with the contribution the subsidiary makes to the competitive position of the corporation as a whole.

As a result of globalization, subsidiary performance becomes multifaceted, defined by both local and worldwide corporate objectives. Presumably, this fundamental change in the role or focus of subsidiaries should be supported by a properly configured reward structure. Thus, the primary research objective of this study was to determine appropriate compensation strategies for supporting managers of foreign subsidiaries within the global industry context. More specifically, we argue that the agency problem associated with foreign subsidiary characteristics is a critical influence in the determination of the compensation strategies necessary to produce desired organizational outcomes.

THEORY AND HYPOTHESES

Agency theory has been important for understanding the design of compensation strategy. From an agency perspective, social relationships are an interaction between a principal and an agent. In essence, the principal delegates work to the agent (Eisenhardt, 1989; Fama & Jensen, 1983). The *agency problem* in this relationship arises from incongruence between the goals of principal and agent and because of difficulty in monitoring or verifying agent behavior (Eisenhardt, 1989; Nilakant & Rao, 1994; Zajac & Westphal, 1994). Goal incongruence is based on the assumption that principals and agents are both utility maximizers. Thus, agents will pursue their own interests, which may diverge from the interests of principal (Jensen & Meckling, 1976). Eisenhardt (1989) suggested that this assumed incongruence, or goal conflict, may be reduced in situations in which there is a high level of socialization, such as a "clan-oriented" firm (Ouchi, 1979), or where behavior is not self-directed.

A principal can further limit the agency problem by incurring monitoring costs or by designing appropriate incentives for an agent (Jensen & Meckling, 1976: 308). In simple situations, resources may be invested into directly monitoring the agent's actions (Holmström, 1979). However, in more complex situations, difficulty in monitoring or verifying agent behavior results from information asymmetry, a situation in which the agent has information that is not available to the principal (Gomez-Mejia & Balkin, 1992b). Information asymmetries are created when agents have more specialized knowledge than principals regarding task performance and a high level of managerial discre-

tion (Gomez-Mejia & Balkin, 1992b; Rajagopalan & Finkelstein, 1992). Managerial discretion accompanies environmental and strategic complexities, which create operational contexts with multiple decision options, low task programmability, and ambiguous cause-effect relationships (Eisenhardt, 1988; Gerhart & Milkovich, 1990; Rajagopalan & Finkelstein, 1992). Agency theory prescribes the use of compensation based on the performance of agents as resultant information asymmetries make their behavior costly or difficult to observe (Conlon & Parks, 1990).

The Agency Problem in the Headquarters-Foreign Subsidiary Relationship

Agency theory is relevant to situations that have a principal-agent structure. In this study, the headquarters-foreign subsidiary is considered such a structure as headquarters delegates work and responsibilities to foreign subsidiaries. Nohria and Ghoshal further described the attributes of the headquarters-subsidiary relationship that give rise to its having a principal-agent structure:

As the principal, the headquarters cannot effectively make all the decisions in the MNC [multinational corporation] since it does not possess and must, therefore, depend on the unique knowledge of subsidiaries. At the same time, the headquarters cannot relinquish all decision-rights to the subsidiaries since the local interests of subsidiaries may not always be aligned with those of the headquarters or the MNC as a whole (1994: 492).

Given that the headquarters-foreign subsidiary relationship has a principal-agent structure, in this study it becomes important to specify the factors that will increase the agency problem for this relationship. We argue that in the global industry context, three factors are critical in influencing goal incongruence and information asymmetries thereby determining the potential agency problem within the headquarters-foreign subsidiary relationship. The first factor is *cultural distance*, determined by the degree to which there are differences in the cultural characteristics common to the headquarters market and the market of the foreign subsidiary (Erez & Earley, 1993). With increased cultural distance, complete and accurate information about agents' performance becomes more difficult and expensive to attain. This occurs because, as compared to headquarters, subsidiary management will have greater specialized knowledge regarding the influence of its environment and strategic context on task performance (Gomez-Mejia & Balkin, 1992b). In essence, as cultural distance increases, headquarters becomes more dependent on the subsidiary for information that is either not directly available to headquarters or extremely costly for headquarters to acquire. This information asymmetry arising from cultural distance increases the agency problem in the headquarters-subsidiary relationship.

The second factor that increases the agency problem in the headquarters-foreign subsidiary relationship concerns the strategic and operational role of the foreign subsidiary. Within a global industry, the role of a foreign

subsidiary ranges from *global rationalization* to *lateral centralization* (Crookell, 1990; Roth & Morrison, 1992; Rugman & Bennett, 1982). Global rationalization occurs when the foreign subsidiary is a single part of a worldwide system, with the responsibility for system coordination residing at headquarters. The foreign subsidiary may perform only some of the value-adding processes composing the system. The subsidiary is interdependent with other entities within the firm, but there is little agency problem at the senior management level as the actions and output of the foreign subsidiary must be relatively visible within the networked system and the specialized knowledge needed to manage the system is headquarters based. Similarly, managerial discretion is low at the subsidiary level because the coordinative decision-making responsibilities reside at headquarters.

At the other extreme, with lateral centralization a foreign subsidiary has worldwide responsibility for a complete set of value-adding activities associated with a specific product or product line. The subsidiary controls the research and development, production, and marketing activities of a product or product line on a global basis. Given competition within the global industry context, strategic and operation responsibilities are centralized and coordinated worldwide. However, decision making is not centralized at headquarters but dispersed laterally throughout the organization, with the responsibilities for the sets of value-adding activities for different products or product lines carried out at different subsidiary locations. There is an increasing amount of empirical support for the presence of such "transnational," or "differentiated," networks based on these dispersed and differentiated roles within multinational corporations (Bartlett & Ghoshal, 1989; Ghoshal & Nohria, 1989; Nohria & Ghoshal, 1994; Roth & Morrison, 1992).

Lateral centralization requires subsidiary management to have both specialized knowledge and considerable managerial discretion. Specialized knowledge exists because a subsidiary manages information concerning the product-market and across-unit linkages globally. The subsidiary needs this information to facilitate decision making concerning the coordination of activities of other subsidiaries residing in multiple country locations. Headquarters thereby depends on the subsidiary for this information. Concerning managerial discretion, with lateral centralization foreign subsidiary management has direct responsibility for a multifaceted and proactive global function. Such a role increases the latitude of options available to subsidiary management (Hambrick & Finkelstein, 1987). With the increased decision options of subsidiary management that accompany managerial discretion, management behavior is essentially nonprogrammable. Rajagopalan and Finkelstein suggested that, as managerial discretion increases, "[M]anagers are less constrained in decision making, and monitoring managerial work is more difficult" (1992: 128). In addition, strategic roles conferring managerial discretion are characterized by high ambiguity in behavior-outcome relationships as the number of factors influencing outcomes increases with discretion (Rajagopalan & Finkelstein, 1992). Thus, it is expected that the specialized knowledge and managerial discretion associated with lateral centralization

result in information asymmetries that increase the agency problem in the headquarters-foreign subsidiary relationship.

The third factor affecting the agency problem concerns commitment or psychological alignment at the individual level. Agency theorists assume that the principal-agent relationship is a social one. The fundamental issue is the divergence of principal and agent interests, or goal incongruence. Organizational commitment, as an attitude, has been defined as an individual's identification with and willingness to embrace organizational goals (Mowday, Porter, & Steers, 1982). It follows, therefore, that as an agent accepts and works toward organizational goals, goal incongruence between the principal and agent is reduced and, as a result, the agency problem is low. As Eisenhardt wrote, "[I]f there is no goal conflict, the agent will behave as the principal would like, regardless of whether his or her behavior is monitored" (1989: 62).

Foreign subsidiary managers' values or identification may vary in the degree to which they are attached to a principal organization. We argue that the notion of *parent commitment*, the psychological identification of a foreign manager with headquarters, is particularly important in determining the agency problem within the global industry context. The importance of parent commitment in this context results from the effects of international interdependence within the organization. Competition in a global industry implies increased international interdependence within firms as activities and resources are integrated regionally or worldwide (Bartlett & Ghoshal, 1989; Kobrin, 1991; Roth, Schweiger, & Morrison, 1991). Complex interdependence requires extensive collaboration and mutual adjustments among the participants involved (Galbraith, 1987; Saavedra, Earley, & Van Dyne, 1993; Thompson, 1967). For the foreign subsidiary manager, although commitment to local operations remains important, a high level of commitment to a corporation-wide perspective is necessary as he or she may need to embrace decisions or adjustments that are suboptimal at the subsidiary level. Thus, researchers have suggested the need for a "common world view" or a "company way" of addressing these complex interdependencies within the global industry (Bartlett & Ghoshal, 1989; Prahalad & Doz, 1987). Essentially, this is an application of control through socialization, where the desire is to "deemphasize national cultures and to replace them with an integrating company culture" (Edström & Galbraith, 1977: 256) so that managers at different foreign subsidiary locations are willing to work together and accept a common way of doing things. Thus, we suggest that as the parent commitment of the foreign subsidiary manager increases, goal conflict between the manager and headquarters decreases and, as a consequence, the agency problem is reduced.

In summary, we have argued that cultural distance and lateral centralization influence information asymmetries and parent commitment influences goal incongruence within the headquarters-foreign subsidiary relationship. These two dimensions, information asymmetries and goal incongruence, are fundamental to determining the extent to which an agency problem

potentially exists. To address the agency problem, rather than devise monitoring systems, a principal may establish reward incentive systems for agents (Eisenhardt, 1988; Jensen & Meckling, 1976). As Gomez-Mejia and Balkin noted, "[W]hen an agent has high autonomy, independence and highly specialized knowledge, monitoring becomes very difficult and expensive, so principals will rely on incentives to reward agents for appropriate outcomes" (1992b: 923). Essentially, as the difficulty and costs of monitoring increase, incentive alignment becomes a more important means by which to address the agency problem. Incentive alignment is defined as the extent to which the reward structure is designed to induce managers to make decisions that are in the best interests of the principal (Tosi & Gomez-Mejia, 1989: 171). Properly designed, the reward structure promotes self-monitoring as it provides incentives that "impel agents to minimize opportunistic behavior and promote their compliance with principals' interest" (Kosnik & Bettenhausen, 1992: 312).

Hypothesized Compensation Strategy

In a review of agency theory, Eisenhardt (1989) suggested that future researchers should consider agency contracts governing the principal-agent relationship as a continuum rather than view them as alternate discrete, or "pure," contract forms. In addition, she noted the need to incorporate a broader spectrum of contract forms, as reward systems typically have multiple components. Considering the multiple components of the agency contract and allowing for variance in the degree to which a particular component is emphasized shifts the focus from pure contracts to examining the influence of multiple and mixed reward situations. Incorporating this suggestion, we examined four components of the foreign subsidiary compensation strategy: senior management pay mix, market positioning, subsidiary pay mix, and adjustment criteria for senior management salaries. The first two components, senior management pay mix and market positioning, have been used extensively in previous compensation research and have been found to be important dimensions determining contingency-based compensation strategies (see, for example, Balkin and Gomez-Mejia [1987, 1990], Galbraith and Merrill [1991], Finkelstein and Hambrick [1989], and Fisher and Govindarajan [1992]). Thus, we included these two components to maintain comparability with previous studies. More important, they directly capture the incentives that agency theory suggests promote self-monitoring.

Although the preceding arguments focused on defining the agent as the top management of a foreign subsidiary, individuals at lower levels of the subsidiary may also contribute to the agency problem. As will be argued later, this is a particularly important consideration in the global industry context. Thus, we considered the pay mix for the entire subsidiary an important compensation component to include in this study. The final component, senior management salary adjustment criteria, was included because, at the subsidiary level, "nonincentive" compensation often constitutes the major portion of the reward structure. Therefore, we considered the basis on which

performance is assessed for salary adjustments to be a potentially critical compensation component to examine in the foreign subsidiary context.

Senior management pay mix. The discussion in the preceding section suggested that the agency problem is potentially greater when a foreign subsidiary has: (1) high cultural distance from headquarters, (2) a lateral centralization form, and (3) low commitment of the senior subsidiary manager to the parent organization. The arguments regarding the design of compensation strategy in response to agency problem are well developed in the literature (readers are referred to Fama and Jensen [1983], Holmström [1979], Shavell [1979], and Tosi and Gomez-Mejia [1989]). Given the potential agency problem, researchers' basic objective has been to specify the most efficient contract by which to govern the principal-agent relationship. Two basic contract forms are delineated in the literature: behavior-oriented and outcome-oriented (Eisenhardt, 1989; Nilakant & Rao, 1994; Rajagopalan & Finkelstein, 1992). Behavior-oriented contracts include non-incentive-based, or fixed, salary, whereas outcome-oriented contracts include incentive-based, or commission, compensation. As Tosi and Gomez-Mejia (1989: 172) summarized, theory and research have both led to the conclusion that the agency problem is minimized when compensation for senior managers is incentive based in that it is tied to their performance. Incentive-based compensation is the more efficient contract when appropriate managerial behaviors are difficult to monitor (Jensen & Meckling, 1976). Alternately, if an agent is expected to perform a behavior that can be observed directly, the agent should be paid directly for that behavior via salary (Eisenhardt, 1988: 493). Extending these arguments to the foreign subsidiary context, we suggest that

Hypothesis 1a: As the cultural distance of a subsidiary from corporate headquarters increases, senior subsidiary management will receive a greater proportion of compensation through incentives.

Hypothesis 1b: As the lateral centralization of a foreign subsidiary increases, senior subsidiary management will receive a greater proportion of compensation through incentives.

Hypothesis 1c: As the parent commitment of the senior manager of a foreign subsidiary decreases, senior subsidiary management will receive a greater proportion of compensation through incentives.

Market positioning. In this study, market positioning is defined as the extent to which the average pay level of a subsidiary's employees is above or below that of its competitors (Balkin & Gomez-Mejia, 1990). Given that incentive-based pay plans are uncertain, Rajagopalan and Finkelstein (1992: 128) suggested that such plans "increase managerial risk and tend to be balanced with greater amounts of pay (Eaton & Rosen, 1983)" and found

that prospecting firms—those firms pursuing aggressive market growth and innovation strategies—used incentive-based compensation plans for senior management. However, because the risk associated with aggressive innovation strategies increased outcome uncertainty, the attractiveness of incentive-based pay plans was reduced in that they shifted risk to managers. Thus, a higher level of compensation (relative to firms pursuing other strategies) was used to balance the reward structure. Extending this discussion to foreign subsidiary compensation strategy, we argued previously that as the agency problem increases, incentive-based compensation will be used. A higher level of pay would likely be needed to attract and retain managers to compensate for the added outcome uncertainty and risk (Conlon & Parks, 1990). Thus,

Hypothesis 2a: As the cultural distance of a subsidiary from corporate headquarters increases, the higher the compensation level for senior subsidiary management relative to the market.

Hypothesis 2b: As the lateral centralization of a foreign subsidiary increases, the higher the compensation level for senior subsidiary management relative to the market.

Hypothesis 2c: As the parent commitment of the senior manager of foreign subsidiary decreases, the higher the compensation level for senior subsidiary management relative to the market.

Subsidiary pay mix. Compensation strategy concerns the pay mix at all levels of an organization, not simply the senior management level. Giving incentive-based compensation such as bonuses only to senior management can be demoralizing to organizational participants at lower levels (Balkin & Gomez-Mejia, 1987). This demoralization would have particularly adverse consequences if the performance of a unit were contingent upon its members working together as a team or with other units.

Multinational corporations pursuing global operational approaches to competing in global industries have been found to employ extensive coordination of subsidiary activities across locations and to exhibit a high level of shared values or management philosophy (Bartlett & Ghoshal, 1989; Roth et al., 1991). Global strategy implementation requires an increased capacity for integrated actions within a multinational. The coordination of activities at the functional and task levels creates operational interdependence. As Bartlett and Ghoshal noted, a critical implementation issue in managing global interdependence is developing a “shared vision and personal commitment to integrate the organization at the fundamental level of individual members” (1989: 66). This issue is critical because the information and tasks to be integrated occur at operational levels within the multinational. As a result, specialized knowledge is also developed at operational levels within the foreign subsidiary. Furthermore, to facilitate cooperative exchanges across borders it becomes critical for individuals at lower levels of the subsidiary

to embrace corporation-wide goals. Thus, extending the previous arguments regarding pay mix at the senior management level, we also expected that as the agency problem increases, increased use of incentive-based compensation applied at the subsidiary level will be the more efficient contract form. This form would provide motivational incentive at the *individual* level as required by Bartlett and Ghoshal's description of effective global strategy implementation, consistent with and reinforcing such incentives at the senior management level. Thus,

Hypothesis 3a: As the cultural distance of a subsidiary from corporate headquarters increases, subsidiary personnel will receive a greater proportion of their compensation through incentives.

Hypothesis 3b: As the lateral centralization of a foreign subsidiary increases, subsidiary personnel will receive a greater proportion of their compensation through incentives.

Hypothesis 3c: As the parent commitment of the senior manager of a foreign subsidiary decreases, subsidiary personnel will receive a greater proportion of their compensation through incentives.

Salary adjustment criteria. Two of the preceding sets of hypotheses (1a–1c, 3a–3c) examine the proportions of compensation allocated to incentive and nonincentive components, the proposition being that this proportion should change depending on the extent of the agency problem. As the agency problem increases, a company may also make some modification to the nonincentive compensation component to induce behavior consistent with headquarters-based objectives. As was stated previously, the essence of the incentive-based compensation design is to reduce monitoring costs in a situation in which appropriate behaviors are difficult to monitor or determine (Rajagopalan & Finkelstein, 1992: 128). In the headquarters-foreign subsidiary context, subsidiary senior management is the focal point for balancing the interests of headquarters and the local operations (Gregersen & Black, 1992). Although the expectation is that balancing these conflicting interests increases the need for incentives, some reward alignment also may be possible in the criteria used in a performance evaluation system for increasing the fixed salary of subsidiary management. Given that nonincentive compensation may be the major portion of the total compensation paid to subsidiary management, this reward alignment is potentially critical. Rather than base salary adjustments solely on individual or subsidiary performance, as the agency problem increases a company may shift the criteria for evaluating senior subsidiary management salaries to include regional or corporation-level performance, or both. In this manner, pay policies—the basis for salary adjustments—for the nonincentive component of subsidiary senior management compensation may also induce behavior that reinforces corporate objectives. Thus,

Hypothesis 4a: As the cultural distance of a subsidiary from corporate headquarters increases, the greater the percentage weight given to regional and corporate performance as criteria for determining the salary adjustments of senior subsidiary management.

Hypothesis 4b: As the lateral centralization of a foreign subsidiary increases, the greater the percentage weight given to regional and corporate performance as criteria for determining the salary adjustments of senior subsidiary management.

Hypothesis 4c: As the parent commitment of the senior manager of foreign subsidiary decreases, the greater the percentage weight given to regional and corporate performance as criteria for determining the salary adjustments of senior subsidiary management.

Implications for Subsidiary Effectiveness

Studies examining compensation strategy have been concerned primarily with identifying the contingencies, or determinants, of reward structure designs. However, the overall design of a compensation strategy is presumed to elicit some type of organizational outcome, with the indirect or direct effect being enhanced firm performance (Gerhart & Milkovich, 1990; Gomez-Mejia, 1992; Tosi & Gomez-Mejia, 1989). Given the lack of prior research addressing the performance outcomes associated with compensation strategy in the global context and at the foreign subsidiary level, we attempted to make an initial step in examining such outcomes.

The preceding hypotheses are bivariate, focusing on the design of a particular compensation component in response to the agency problem. Because bivariate relationships are essentially reductionistic, previous studies have found that using a systems, or configurational, approach is important when theory suggests that normative outcomes are associated with the alignment of a system (Govindarajan, 1988; Gresov, 1989; Venkatraman & Prescott, 1990). Such an approach attributes increased effectiveness to the internal consistency, or fit, among multiple contextual and design factors (Doty, Glick, & Huber, 1993).

The hypotheses given above specify a unified compensation strategy, the design of which depends on the extent of the agency problem. When the agency problem is "high," we posit that a foreign subsidiary compensation system should emphasize incentive-based pay at both the senior management and subsidiary levels and pay at above-market levels and should use regional and corporate performance as criteria for determining salary adjustments for senior subsidiary management. Incentive alignment—the degree to which a compensation system is designed to induce a subsidiary's management to make decisions that are in the best interests of headquarters—should result

in the foreign subsidiary's realizing the outcomes or objectives designated by headquarters.

In this study, the desired outcome was defined as perceived subsidiary effectiveness. We examined perceived subsidiary effectiveness because subsidiaries can be evaluated on a wide range of performance dimensions. As Govindarajan and Fisher noted, "[I]t is not possible to use the same set of criteria to evaluate every SBU since, by definition, different SBU strategies imply quite different goals and priorities" (1990: 269). This issue is particularly important in the context of subsidiaries in different countries in organizations that vary subsidiary roles and responsibilities globally. For example, a subsidiary may operate in a location for the purpose of establishing a presence in a sophisticated market, thereby providing access to leading-edge consumers and technological developments. Evaluation of the subsidiary would necessarily include dimensions beyond traditional profitability indicators. In addition, implementing global strategies implies interdependence between units within the firm. Gomez-Mejia and Balkin noted that the more interdependent units in a firm are, "the more difficult it is to identify the contribution [to performance] of any one unit" (1992a: 44). Thus, the definition of subsidiary effectiveness is determined by the performance dimensions a principal expects. Given the compensation strategy configuration articulated in the preceding hypotheses, we forward a systems hypothesis.

Hypothesis 5: Incentive alignment will be positively associated with perceived subsidiary effectiveness.

METHODS

Industry Selection and Sample

The sampling domain of this study was foreign subsidiaries within a global industry context. Two global industries were selected: (1) scientific measuring instruments and controls and (2) surgical and medical instruments. These industries were identified in Kobrin's (1991) study as having a high level of transnational integration, a condition Kobrin suggested as indicating industry globalization. In addition, other studies using alternate methodologies have also identified these two industries as having a global industry structure (Cvar, 1984; Morrison & Roth, 1992; Roth & Ricks, 1994). Within the broader set of possible global industries, we used these two in particular to control for possible confounding industry influences as previous studies have suggested that industry growth, profitability, and R&D intensiveness may influence compensation strategies (Balkin & Gomez-Mejia, 1987; Galbraith & Merrill, 1991). These two industries do not differ markedly along these industry characteristics.

From the selected global industries, we identified foreign subsidiaries located in the United States, United Kingdom, Canada, Japan, and Germany using three directories: the *International Directory of Corporate Affiliations*, *America's Corporate Families and International Affiliates*, and the *Directory of Foreign Capital Affiliated Enterprises in Japan*. For a foreign subsidiary

to be included in the sample, the parent company had to own at least 51 percent of the subsidiary and be headquartered in one of the other four countries. For example, in the United Kingdom we identified foreign subsidiaries of corporations based in the United States, Canada, Japan, and Germany. This process resulted in an initial set of 427 foreign subsidiaries for which a contact name could be identified. Further verification of the senior manager of each subsidiary and correct addresses and industry information resulted in a final set of 372 subsidiaries. Responses to a mail questionnaire were received from the senior managers of 100 foreign subsidiaries. The distribution of the respondents was as follows: 40 foreign subsidiaries within the United States, 22 in the United Kingdom, 14 in Canada, 12 in Japan, and 12 in Germany. The sales of the subsidiaries ranged from \$2 million (U.S. dollars) to \$1.8 billion, with the average sales level being \$144 million (s.d. = 265 million). The subsidiaries represented 73 different corporate parents, and the sales of the parents ranged from \$14 million to \$60 billion, with the average parent sales being \$3.5 billion (s.d. = 8.6 billion).

Two procedures were used to examine nonresponse bias. Kazanjian and Drazin (1989) detailed an extrapolation procedure for evaluating nonresponse bias. Drawing on the work of Armstrong and Overton (1977), they maintained that the profile of nonrespondents is likely to be more similar to that of late respondents than that of early respondents. The current study used an initial mailing followed by two additional mailings to nonrespondents made four weeks and eight weeks later. When we compared all variables included in the models, the means of the last set of respondents did not differ significantly from those of the first set of respondents. A second procedure used to examine whether the responding firms differed from the nonresponding firms involved gathering secondary data for a subset of the nonresponding firms. Randomly selecting 52 subsidiaries for which data on sales and number of employees were available, we found that a comparison of the means of these two variables indicated no significant differences.

Measures

Agency problem. Three components of the agency problem were examined. The first, *cultural distance*, is defined so as to reflect the difference between the cultures of the two countries in which the principal and agent are located. Hofstede (1980, 1991) found that cultures differ substantially on four attributes that he labeled individualism, masculinity, uncertainty avoidance, and power distance. He reported values based on a large-scale empirical study for 50 countries and three regions on each of these four dimensions. Using a procedure similar to one developed by Kogut and Singh (1988), we formed a composite index for each headquarters-subsidiary country pair based on their deviations from one another on each of the four cultural dimensions. The cultural distance for each possible headquarters-subsidiary country pair was calculated using the following equation:

$$CD_{jk} = \ln \sum \{(D_{ij} - D_{ik})^2 / V_i\} / 4,$$

where CD_{jk} = the cultural distance between countries j and k , D_{ij} = the score for parent country j on cultural dimension i , D_{ik} = the score for subsidiary country k on cultural dimension i , and V_i = the variance of the index for cultural dimension i . This formula corrects for the variance of each cultural dimension and averages across the four dimensions.

The second component, *lateral centralization*, was measured with an index patterned after the Roth and Morrison (1992) subsidiary scale. Executives were asked to indicate the extent to which eight statements described the responsibilities of their subsidiary. The statements were (1) the subsidiary is primarily an implementor of headquarters-developed strategy, (2) the subsidiary has worldwide responsibility for production activities of a product or product line, (3) product expertise within the corporation resides within this subsidiary, (4) the subsidiary maintains control over the export marketing of products, (5) production process innovations are developed by the subsidiary, (6) the subsidiary has worldwide responsibility for marketing activities of a product or product line, (7) the subsidiary controls product research and development activities, and (8) international market development costs are incurred by the subsidiary. We used a five-point scale (1 = not at all characteristic to 5 = extremely characteristic) and averaged the responses to create an overall lateral centralization score.

The construct reliability and validity of this measure were assessed three ways. First, the internal reliability (Cronbach's coefficient alpha) was examined and found acceptable ($\alpha = .90$). Second, from an agency perspective the critical implication of lateral centralization is increased subsidiary autonomy. Using a measure adapted from Egelhoff's (1988) autonomy/centralization index, we asked executives to indicate for 23 decision areas the extent to which a subsidiary made decisions independently. As expected, the lateral centralization measure was found to be correlated with the autonomy index ($r = .71, p < .001$). The final validity assessment was based on contacting the senior vice president (V.P.) or V.P. international at headquarters for 28 subsidiaries. Identification of these individuals was based on phone interviews with subsidiary or headquarters personnel to determine the direct reporting relationship of the subsidiary. The headquarters manager received a mail questionnaire naming the specific subsidiary included in the study and was asked to respond to the lateral centralization measurement items for the subsidiary. The correlation coefficient between the headquarters and subsidiary measures of lateral centralization was .80 ($p < .001$).

The third component of the agency problem is *parent commitment*. We measured parent commitment by the senior manager's commitment to headquarters using a scale adapted from Gregersen and Black (1992). The Gregersen and Black scale was developed from previous studies measuring organizational commitment and has been found to have a high level of reliability and validity (Mowday et al., 1982; O'Reilly & Chatman, 1983). The internal reliability for the parent commitment scale ($\alpha = .83$) was generally consistent with reliabilities reported by Gregersen and Black.

Compensation strategy. Four components of compensation strategy were measured. *Senior management pay mix* was measured by the percentage of total senior management compensation paid through a (1) short-term bonus plan, (2) long-term bonus plan, (3) short-term equity plan, and (4) long-term equity plan. This scale was based on similar measures used in the Balkin and Gomez-Mejia (1987) and Galbraith and Merrill (1991) studies and was self-reported by each subsidiary senior manager. To assess the validity of the information provided by the senior manager, for 41 subsidiaries we identified the human resources (HR) manager at the subsidiary or headquarters location and asked him or her to provide pay mix compensation information for subsidiary senior management. The average correlation between the pay mix reported by the subsidiary senior managers and the HR managers was .62 ($p < .001$).

Market positioning was defined as the extent to which the pay level of the subsidiary was above or below that of competitors. This component was measured using a scale adapted from Balkin and Gomez-Mejia (1990). For both salary and incentives, respondents were asked to rate the compensation level of their subsidiary as compared to that of competitors.

To measure *subsidiary pay mix*, we modified the senior management pay mix scale to capture the percentage of total compensation paid by the subsidiary through incentive-based compensation forms (using the four plans detailed above) to all employees. The average correlation between the pay mix reported by the subsidiary senior managers and the 41 HR managers was .35 ($p < .05$). Although significant, this correlation was lower than expected. Follow-up interviews indicated that headquarters respondents often had limited information about the use of incentives at lower levels within foreign subsidiaries.

The *salary adjustment criteria* concerns the basis for evaluating senior subsidiary management performance for salary adjustments. For the salary component of the compensation program, we asked the respondents to indicate "the approximate weight" given to each criterion used as a basis for evaluating their performance. Respondents reported the percentage weight given to the following criteria: (1) individual performance, (2) subsidiary performance, (3) regional performance, and (4) corporate performance. The salary adjustment criteria construct, reflecting the reward alignment for the nonincentive compensation component, was the aggregate percentage of the salary adjustment criteria given to regional and corporate performance. The correlation between the headquarters and subsidiary measures of salary adjustment criteria was .96 ($p < .001$).

Subsidiary effectiveness. Given that performance expectations may vary across subsidiaries, country contexts, and different performance dimensions, it was not possible to use a single performance criterion for all subsidiaries. Thus, we developed a multidimensional scale, with the performance dimensions taken from similar measures used in studies examining business unit or profit center performance (Govindarajan & Fisher, 1990; Gupta & Govindarajan, 1986). Ten performance dimensions were listed: sales volume, market

share, profit, cash flow from operations, return on investment, new product development, market development, cost control, personnel development, and political/public affairs. For each dimension, respondents were asked to rate the performance of their subsidiary, relative to superiors' expectations, on a five-point scale ranging from 1, "not at all satisfactory," to 5, "outstanding." We created an average effectiveness index for each foreign subsidiary using the reported performance on each dimension. As Gupta and Govindarajan noted, a high correlation between superiors' and self-ratings can be expected in situations in which "subordinates are guaranteed anonymity and understand that the objective of data collection is scientific, not evaluation" (1986: 713). Both of these conditions were met in this study. In addition, Govindarajan and Fisher (1990) found a strong correlation between manager and superior assessments using this measurement approach. In this study, for 28 subsidiaries, the senior V.P. or V.P. international at headquarters also evaluated subsidiary effectiveness using the ten performance dimensions. The correlation between the headquarters and subsidiary measures of subsidiary effectiveness was .65 ($p < .001$). Thus, although it is certainly acknowledged that self-reported subjective measures have limitations, it would appear that the measurement approach used was both valid and appropriate for this study.

Control variables. Studies suggest that corporate diversification influences compensation strategy. Gomez-Mejia (1992) argued that as corporations diversify, headquarters has less detailed knowledge about subunits. Interdependence between units may also decrease as a result of diversification. These conditions lead to greater use of incentive compensation and risk sharing (Gomez-Mejia, 1992). Thus, when estimating the compensation strategy relationships, we included extent of corporate diversification as a control variable, measured by the number of industries (defined by four-digit Standard Industrial Classification [SIC] code) outside the firm's primary industry in which the firm had businesses.

Organization size has been found to be related to the design and positioning of compensation strategy (Fisher & Govindarajan, 1992; Lewellen & Huntsman, 1970). This influence occurs apparently at both the corporate and business-unit level (Balkin & Gomez-Mejia, 1990). Thus, corporate and subsidiary size, measured as the logarithm of annual sales, were included as control variables. Level of subsidiary profitability may also influence compensation strategy and perceived outcomes. The pretest indicated that managers would be hesitant to report objective performance information, so we calculated the profitability control variable, after-tax return on investment, using a seven-point range in which 1 was "negative return on total investment," 2 was "between 0%–5%," 3 was "between 5%–10%," 4 was "between 10%–15%," 5 was "between 15%–20%," 6 was "between 20–25%," and 7 was "greater than 25%."

Several authors have contended that the compensation strategy of foreign subsidiaries should reflect local cultural norms and standards (Gomez-Mejia & Welbourne, 1992; Hodgetts & Luthans, 1993). However, a study by

Rosenzweig and Nohria (1994) found that although foreign subsidiary human resources practices closely paralleled local country contexts, executive bonuses did not vary. Thus, although the evidence is inconclusive, it is potentially important to examine the influence that a host country may have on compensation strategy design. We therefore compared the mean responses on the compensation variables across host country locations to evaluate the appropriateness of pooling the data. This analysis indicated that foreign subsidiaries in the United Kingdom had a significantly lower use of incentive-based compensation for senior management and lower market positioning than the other host country locations. Thus, a nationality dummy variable (coded for the U.K.) was included in the senior management pay mix and market positioning equations.

Analysis

The first four hypotheses were tested using regression analysis. The alignment hypothesis (Hypothesis 5) was tested with the pattern analysis procedure suggested by Drazin and Van de Ven (1985) and used by numerous researchers examining fit or match hypotheses (Doty et al., 1993; Govindarajan, 1988; Gresov, 1989; Roth, 1995; Venkatraman & Prescott, 1990). This procedure is considered appropriate for examining the aggregate effect of deviations across multiple design dimensions simultaneously (Gresov, 1989: 443). The procedure involves defining the ideal profile for each contingency condition and then examining performance as firms move away from the ideal profile. In this study, we used empirically derived profiles because a theoretical profile, based on scale endpoints, is not consistent with the "optimal" compensation level. For example, theory does not suggest that the senior management or subsidiary pay mix should be exclusively incentive based in response to the agency problem.

To derive the profiles, we created an aggregate "agency problem" index using the three agency components. As Gresov (1989) suggested, observations scoring in the middle third were dropped to better distinguish differences between firms on the agency index. We then identified the top five performers in the high agency-problem group and the top five in the low agency-problem group. Means on the compensation components were computed for the high-performing firms in each group and used to define the ideal profile. An alignment, or fit, measure was then calculated for the remaining firms within each group, based on the euclidean distance over the range of compensation components. In the final step, we correlated subsidiary effectiveness with the fit index. A significant negative correlation would support the alignment hypothesis, as deviations from the pattern would be associated with a decline in performance.

RESULTS

Table 1 provides the summary statistics for the variables. The significant correlations between the components characterizing the agency problem in this study suggested that the parameter estimates might be imprecise because

TABLE 1
Descriptive Statistics and Correlations

Variable	Mean	s.d.	1	2	3	4	5	6	7
1. Cultural distance	1.60	1.31							
2. Lateral centralization	2.52	1.22	-.38***						
3. Parent commitment	2.62	0.83	.24**	-.32**					
4. Senior management pay mix	22.57	11.30	.10	.24*	.24**				
5. Market positioning	1.99	0.45	.13	.15	.20†	.38***			
6. Subsidiary pay mix	10.20	8.87	.48***	-.23*	.16	.11	.22*		
7. Salary adjustment criteria	1.51	5.71	.14	-.14	-.10	-.09	.04	.09	
8. Subsidiary effectiveness	3.31	0.59	-.20†	.11	.19†	.28**	.19†	.01	-.08

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

of multicollinearity. Thus, we assessed the degree to which collinearity influenced the regression estimates following procedures recommended by Belsley, Kuh, and Welsch (1980). These procedures indicated that the estimates were not degraded by the presence of collinearity.

The first set of hypotheses (1a–1c) addresses how the pay mix for the senior management of a foreign subsidiary is related to the agency problem. As results for the first equation reported in Table 2 indicate, cultural distance was not found to be related to senior management pay mix, so Hypothesis 1a was not supported. Support was provided for Hypothesis 1b as incentive-based compensation for senior management increased when subsidiaries were characterized by lateral centralization. For Hypothesis 1c, we found that, contrary to the hypothesized direction, the use of incentive-based compensation increased with higher levels of senior management commitment to the parent organization.

The second equation reported in Table 2 examines the posited relationship between the agency problem and the extent to which the pay level of the subsidiary is above or below that of its competitors. Neither cultural distance (Hypothesis 2a) nor parent commitment (Hypothesis 2c) influenced

TABLE 2
Results of Analysis for Compensation Strategy^a

Independent Variable	Senior Management Pay Mix	Market Positioning	Subsidiary Pay Mix	Salary Adjustment Criteria
Cultural distance	0.31 (1.05)	0.04 (0.05)	3.23*** (0.76)	0.96 [†] (0.59)
Lateral centralization	2.43* (1.05)	0.10* (0.05)	-0.83 (0.79)	-0.90 (0.61)
Parent commitment	3.61* (1.41)	0.11 [†] (0.06)	-0.04 (1.10)	-1.75* (0.86)
Corporation diversification	-0.16 (1.83)	0.01 (0.01)	-0.08 (0.14)	-0.04 (0.11)
Corporate size	0.81 (0.64)	0.01 (0.03)	0.19 (0.50)	-1.03** (0.39)
Subsidiary size	-0.50 (0.92)	-0.06 (0.04)	-0.05 (0.72)	-0.15 (0.55)
Subsidiary profitability	0.49 (0.53)	0.05* (0.02)	0.71 (0.40)	0.03 (0.31)
Nationality	-9.16** (2.98)	-0.33* (0.13)		
<i>F</i>	3.81***	3.10**	4.68***	2.75**
<i>R</i> ²	0.30	0.28	0.31	0.22
Adjusted <i>R</i> ²	0.22	0.19	0.25	0.14

^a Unstandardized regression coefficients are reported; standard errors are in parentheses.

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

market positioning. Hypothesis 2b was supported as market positioning was positively related to lateral centralization.

The relationship between the agency problem and the pay mix of subsidiaries is examined in the third equation in Table 2. Strong support exists for Hypothesis 3a: a greater proportion of incentive-based compensation was used for subsidiary personnel as the cultural distance between the subsidiary and headquarters increased. No support was found for Hypotheses 3b and 3c. The final equation in Table 2 examines the relationship between the agency problem and salary adjustment criteria for senior subsidiary management. The coefficients for both cultural distance and lateral centralization were not significant, offering no support for Hypotheses 4a and 4b. Hypothesis 4c was supported as the coefficient for parent commitment was significant and in the expected direction. Thus, consistent with the agency theory argument, a greater weight was attached to regional and corporate performance as criteria for senior management salary adjustments when the commitment of the senior manager to the parent organization was lower.

Table 3 reports the ideal profiles used in examining the incentive alignment hypothesis (Hypothesis 5). Table 4 reports the results of the pattern analysis examining the relationship between incentive alignment and subsidiary effectiveness. Hypothesis 5 was supported as subsidiary effectiveness was found to decline as subsidiaries moved away from the ideal profiles.

DISCUSSION AND CONCLUSIONS

This study was designed to examine the influence of the agency problem in headquarters-foreign subsidiary relationships on the compensation strat-

TABLE 3
Incentive Alignment Ideal Profiles^a

Variable	Agency Problem	
	High	Low
Senior management pay mix	31.0	17.8
Market positioning	2.2	1.8
Subsidiary pay mix	10.0	7.8
Salary adjustment criteria	0.0	0.0

^a Unstandardized means are reported.

TABLE 4
Correlations of Distance Measures and Subsidiary Effectiveness

Agency Problem	N	Subsidiary Effectiveness
High	33	-0.37*
Low	32	-0.59**

* $p < .05$

** $p < .01$

egy of foreign subsidiaries. In addition, we examined the association between compensation strategy and perceived subsidiary effectiveness. Extending agency theory to the headquarters-foreign subsidiary relationship in a global industry context, we framed hypotheses relating the agency problem to compensation strategy. Examining these hypotheses with data from a sample of 100 foreign subsidiaries from five countries yielded specific findings that can be summarized as follows: (1) the percentage of senior management's incentive-based compensation increases when a subsidiary has a lateral centralization form and its senior manager has a higher level of commitment to headquarters. (2) The level of compensation increases relative to competitors' when a subsidiary has a lateral centralization form. (3) The percentage of total incentive-based compensation paid by the subsidiary increases with the foreign subsidiary's cultural distance. (4) More weight is given to regional and corporate performance when the senior manager of the foreign subsidiary has a lower level of parent commitment. (5) The perceived effectiveness of the subsidiary increases as the compensation strategy is designed in response to the agency problem.

The results of this study provide moderate support for the application of an agency theory perspective to compensation strategy within the headquarters-foreign subsidiary relationship. However, the results also suggest that the agency problem within the foreign subsidiary context is multidimensional, with different aspects of the problem influencing different compensation strategy components.

Cultural distance and lateral centralization were considered important for understanding the degree to which the agency problem may exist for a headquarters-foreign subsidiary relationship. We argued that these variables reflect the extent of information asymmetry between headquarters and the subsidiary resulting from managerial discretion and subsidiary environmental and strategy-specific knowledge. Cultural distance was found to be associated only with subsidiary pay mix, with the use of incentive-based compensation increasing with distance. If a one-tailed test is used, cultural distance also influences the use of regional and corporate performance criteria as a basis for salary adjustments ($p < .03$). In contrast, lateral centralization was found to influence the senior management pay mix and market positioning components.

There are two basic explanations as to why cultural distance and lateral centralization may have different influences on compensation strategy. First, the two variables correspond to different analysis levels. Cultural distance is a nationality dimension that would be the same for a given combination of home and host country, whereas lateral centralization is subsidiary-specific. Thus, subsidiaries within a host country context may all have to respond to local contextual conditions in configuring certain components of their incentive structure, such as the use of incentives for all subsidiary personnel. However, for other compensation components, such as the pay mix for subsidiary senior management, firm-specific pressures—such as attempting to provide equity among managers at relatively high levels of the organization—

rather than host country pressures may dominate. This issue, the unique and interactive effects of local isomorphism, or responses to country-specific practices and firm-specific practices, warrants additional research attention. Essentially, the results of this study suggest that future studies integrating institutional theory and agency theory explanations of compensation strategy in a vein similar to Eisenhardt's (1988) approach could make an important contribution to understanding compensation practices at the foreign subsidiary level.

The second explanation concerns the possible relationship between cultural distance and lateral centralization. For the subsidiaries in this study, cultural distance and lateral centralization were negatively related (Table 1). This finding suggests that although multinational corporations are using differentiated approaches in which subsidiaries are selectively given global responsibilities, the subsidiaries assuming such roles are culturally close to their parents. Selecting culturally close subsidiaries may be a temporal or evolutionary state, as firms initially employing lateral centralization may give global responsibilities to subsidiaries more easily observed or better trusted because of culture-based understanding. Alternately, it may simply be that subsidiaries with the resources and competencies to assume a global role are the closer units, as many foreign investment activities historically have occurred in markets that are culturally closer (Johanson & Vahlne, 1990; Kogut & Singh, 1988).

As stated previously, subsidiaries characterized by lateral centralization have an increased level of incentive compensation for senior management and a higher level of compensation relative to competitors than subsidiaries that are part of a rationalized system. This is an important finding in that it not only confirms the applicability of agency theory to further explaining the headquarters-foreign subsidiary relationship, but also verifies the need to realign compensation systems as multinational corporations reorganize and restructure global responsibilities. Specifically, as global strategies are pursued using differentiated network implementation approaches, foreign subsidiary management compensation should include an incentive-based component for senior management. Subsidiaries identified as top performers reported an average total incentive compensation for senior management of over 30 percent (Table 3). This figure only suggests an optimal level, but it does indicate that a significant portion of such compensation is incentive-based. The inflection point in this relationship, where the outcomes no longer change given an increase in the incentive compensation structure, is certainly an area that needs to be examined by future research as this study does not establish the level at which an incentive structure will optimize returns.

Lateral centralization does not appear to influence the subsidiary pay mix or the use of regional and corporate performance as a criteria for senior management salary adjustment. These results were not anticipated. It is possible that if a sample had greater representation of subsidiaries characterized by both cultural distance and lateral centralization, subsidiary pay mix would indeed be altered. Alternatively, lateral centralization may result in

an agency issue predominantly at the senior management level, so modification in the incentive structure for all subsidiary personnel is not required.

Finding no relationship between lateral centralization and the salary adjustment criteria may be attributable to the type of international interdependence that could accompany both lateral centralization and global rationalization. Although we argued that lateral centralization affected the agency problem at the senior management level, operational interdependence at the functional or task level will exist with both the lateral centralization and global rationalization subsidiary forms. The relevant distinction between the two forms concerns the strategic autonomy of senior management occurring as a result of the locus of global decision making. Regardless of a subsidiary's decision-making role, from a strategy implementation perspective, global responses require the foreign subsidiary to have integrated activities at an operational level with headquarters and other units within the multinational (Bartlett & Ghoshal, 1989; Roth et al., 1991). As a result, for both lateral centralization and rationalization, some alignment of the salary performance criteria may be desirable. As international interdependence increases at an operational level, the use of regional and corporate performance criteria would occur irrespective of foreign subsidiary form.

The results regarding the influence of parent commitment are not straightforward. As predicted in our agency arguments, with increased commitment to the parent a lower weight was attached to regional and corporate performance as a salary adjustment criterion. If goal congruence between principal and agent exists, there is little need for salary adjustments to be linked to the performance objectives of the principal. However, increased parent commitment was also found to be related to a *higher* use of incentive-based compensation, a finding counter to an agency theory view. Perhaps managers exhibiting a high level of commitment to a parent are perceived as having greater potential to affect organizational outcomes than managers with lower organizational commitment. Gerhart and Milkovich (1990) suggested that a strong perceived link between an employee behavior and organizational performance offers increased opportunity to use incentive-based compensation. Furthermore, the high commitment to the parent may be a result of considerable human capital investments such as training and experience. Extending human capital theory, Gerhart and Milkovich (1990) argued that these human capital investments are also likely to be related to a high potential to influence performance outcomes and therefore associated with the use of contingent pay. In the foreign subsidiary context, human capital theory and expectancy theory may provide a more useful theoretical link between individual characteristics and pay mix than agency arguments.

The final conclusion concerns the relationship between compensation strategy and organizational outcomes. As an integrated system, compensation strategy was found to have a strong impact on perceived subsidiary effectiveness. This result is rather tentative given that effectiveness was measured subjectively and self-reported by subsidiary management; however, it does suggest that reconfiguring the compensation strategy of a multinational cor-

poration can be effective, particularly if it is responsive to global decision-making responsibilities, cultural distance, and the commitment of the subsidiary management.

Although the results of this study contribute to agency theory through applying the theory in the headquarters-foreign subsidiary context, we acknowledge that the study examines the agency problem rather narrowly. Agency theory is also concerned with the levels and effect of monitoring. Thus, future research needs to incorporate other mechanisms by which the agency problem can be managed, in addition to the compensation strategy of the foreign subsidiary. Mechanisms such as the use of expatriates, third-country nationals, or local nationals with extensive headquarters work experience, as well as management development programs providing international management rotation, may provide corporate socialization that can in turn influence the extent of the agency problem in the headquarters-foreign subsidiary relationship. Such mechanisms may thereby either substitute for or complement compensation strategy adjustments. In addition, for managers of foreign subsidiaries, the compensation package will typically include benefits beyond salary and incentives. Research designs examining a more comprehensive set of dimensions, both monitoring and motivational incentives, would make it possible to assess more completely the techniques and patterns of control that lead to successful headquarters-foreign subsidiary relationships.

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RESEARCH NOTES

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OUTCOMES OF PERCEIVED DISCRIMINATION AMONG HISPANIC EMPLOYEES: IS DIVERSITY MANAGEMENT A LUXURY OR A NECESSITY?

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Perceived discrimination is hypothesized to influence employee outcomes above and beyond other work stressors. Data from 139 Hispanic employees of multiple organizations supported this prediction. In addition, growing up in the United States, membership in the most numerous Hispanic subgroup, salary, and work experience moderated the effect of perceived discrimination on three employee outcomes—organizational commitment, job satisfaction, and work tension.

The rising preoccupation with managing cultural diversity (Adler, 1991; Cox, 1990, 1993; Jackson & Associates, 1992) is understandable in light of current work force trends. In the United States, approximately 45 percent of net additions to the work force in the 1990s will be members of groups normally defined as ethnic minorities (Johnston, 1991).

Apparently, the proliferation of management and training programs concerned with cultural diversity has not been matched by parallel theoretical or research development in organizational behavior (Alderfer & Thomas, 1988; Cox, 1991; Cox & Nkomo, 1990). Critics of programs aimed at raising awareness of cultural differences have questioned their impact on the bottom line, as empirical evidence of the benefits associated with such programs is scant (Cox, 1993: 24–27). The eradication of bias and prejudice is one of the goals of diversity management programs. One of the benefits of these programs may be a less stressful workplace, because survey data indicate that ethnic minorities see prejudice as an important stressor (Kasschau, 1977).

This study was undertaken for a twofold purpose. First, we attempted to gather evidence that perceived discrimination has incremental effects on employee outcomes above and beyond the effects of other stressors. Second, we examined the coping resources that may interact with perceived discrimination to reduce its effects on employee outcomes. Following recent discussions of these terms (Jex, Beehr, & Roberts, 1992), we defined stressors as job or organizational conditions, whereas employee outcomes were defined as individuals' reactions to these conditions. We preferred the term "em-

ployee outcome" to the term "strain" because of our interest in constructs like job satisfaction and organizational commitment, which do not share the meaning work stress researchers assign to the word strain.

Because we were concerned with the various consequences of perceived discrimination, we selected three employee outcomes representing distinct types of work-related attitudinal reactions and feelings: organizational commitment, job satisfaction, and work tension. It should be noted that whereas organizational commitment and job satisfaction represent attitudinal outcomes, work tension is closer to a health-related outcome. Role ambiguity and role conflict were the stressors selected as controls; these are variables not directly related to ethnicity whose relations with employee outcomes have been widely documented (Fisher & Gitelson, 1983; Jackson & Schuler, 1985).

Taking advantage of our location in an area densely populated by Hispanics, we focused on the growing Hispanic segment of the labor force (Gaertner & Dovidio, 1986). Hispanics are playing a leading role in ongoing demographic shifts. Representing 7.6 percent of those employed in 1990, Hispanics are expected to become the largest ethnic minority in the United States and to comprise 10 percent of the country's employees by the year 2000 (Fullerton, 1989; Johnston & Packer, 1987). Judging by the numerous reports of workplace discrimination aimed at Hispanics (e.g., Greve, 1994; Swoboda, 1991), perceived discrimination may be widespread among Hispanic employees.

THEORETICAL BACKGROUND

Incremental Effects of Perceived Discrimination on Employee Outcomes

Although theoretical models of work stress have included the effects of demographic variables on employee outcomes (e.g., Ivancevich & Matteson, 1980: 168–176), few studies have examined the effects of ethnic and minority status (Bhagat & McQuaid, 1982; Cervantes, 1992; Ford, 1985; James, Lovato, & Khoo, 1994). In addition, prior research has focused on the correlates of self-reported ethnicity while ignoring the process through which stressors associated with ethnicity influence employee outcomes. Moreover, virtually no data are available concerning whether or not ethnically relevant stressors have effects on employee outcomes that go above and beyond those of stressors affecting all employees.

According to social identity theory (Tajfel & Turner, 1985), people classify themselves and others into social categories whose content is formed by prototypical characteristics drawn from the category members. Individuals who perceive that they are treated unfavorably because of their membership in a social category would experience feelings of inadequacy and personal conflict (see Phinney [1990] for a review). Thus, perceived discrimination represents an individual's perception that selective and differential treatment is occurring because of the individual's ethnic group membership (Mirage, 1994). Because a sense of belonging to a culturally or ethnically distinct ethnic group triggers this perception, perceived discrimination can be considered a culturally relevant stressor (Cervantes, 1992). However, culturally distinct individuals are not exempt from the well-documented effects of stressors affecting all employees, like role ambiguity and role conflict

(Fisher & Gitelson, 1983; Jackson & Schuler, 1985) and, therefore, perceived discrimination will act as an incremental source of stress among these employees. Hence,

Hypothesis 1: Perceived discrimination will adversely contribute to employee outcomes, going above and beyond other work stressors such as role conflict and ambiguity.

In our view, focusing on perceived discrimination rather than on actual discriminatory practices is worthwhile and consistent with theories positing cognitive appraisal of stressors as key to understanding their effects (Lazarus & Folkman, 1984; Schaubroeck, Ganster, & Fox, 1992). For instance, it is perceived discrimination that causes equal employment opportunity grievances and related litigation expenses.

Perceived Discrimination and Coping Resources

In several models of work stress, moderators of the relationship between work stressors and employee outcomes are proposed (House, 1974; Osipow & Spokane, 1984). These moderators function as coping resources because they contribute to lower levels of strain for a given level of stressor (Osipow & Davis, 1988). That is, individuals with coping resources would not experience increasing levels of strain when they face increasing work stressors. There is empirical evidence concerning numerous variables that moderate, or "buffer," the impact of work stressors on employee outcomes (Beehr, 1985; Fusilier, Ganster, & Mayes, 1987; Houston, Cates, & Kelly, 1992; Jex & Gudanowski, 1992; Pierce, Gardner, Dunham, & Cummings, 1993; Sullivan & Bhagat, 1992). In contrast, the resources needed to cope with cultural stressors like perceived discrimination remain virtually unexamined. To identify the potential moderators of perceived discrimination, we reviewed streams of research on acculturation, social support, and careers.

Acculturation is defined as the process of ethnic minorities' integration into the host or mainstream culture (Mendoza, 1989). Research on acculturation suggests that familiarity with a host culture may protect an individual from the effects of perceived discrimination (LaFromboise, Coleman, & Gerton, 1993; Mendoza, 1989; Phinney, 1990; Sanchez & Fernandez, 1993). Indeed, acculturation reduces feelings of inadequacy caused by perceived discrimination because acculturated individuals perceive themselves as members of both their ethnic group and the mainstream (LaFromboise et al., 1993). Acculturation progresses as a function of the length of exposure to the host culture, and it is facilitated by contact with this culture early in life (Marín, Sabogal, VanOss-Marín, Otero-Sabogal, & Pérez-Stable, 1987; Szapocznik, Scopetta, Kurtines, & Aranalde, 1978). Thus,

Hypothesis 2: Growing up in the United States will moderate the effects of perceived discrimination on employee outcomes: perceived discrimination will affect outcomes for employees who grew up in the United States less than

outcomes for those who grew up outside of the United States.

Social support often moderates the effects of work stressors (Cohen & Wills, 1985; George, Reed, Ballard, Colin, & Fielding, 1993; Kirmeyer & Dougherty, 1988). Researchers have suggested that the buffering effects of social support should be most effective when the source of support is relevant to the stressor being experienced (Beehr, King, & King, 1990; Cohen & Wills, 1985; Ganster, Fusilier, & Mayes, 1986). Attributions of differential treatment to one's ethnicity are the stressor considered here. Interaction with ethnic peers should provide an adequate match to this stressor because such interaction reinforces a sense that being culturally different is all right. In Dade County, Florida, individuals of Cuban origin encounter an extended and potentially more effective social network than Hispanics from other backgrounds. Enhanced opportunities to interact with and receive support from their subgroup should strengthen feelings of adequacy among those of Cuban origin. Hence,

Hypothesis 3: Having an extended social network, defined by membership in the most numerous Hispanic subgroup, will buffer the effects of perceived discrimination on employee outcomes.

The extended network associated with membership in the most numerous Cuban subgroup should buffer the effects of perceived discrimination among Dade County residents. However, in communities where Hispanic subgroups other than Cubans dominate, membership in the dominant subgroup should provide a better support network and hence help buffer the impact of perceived discrimination. Ethnicity researchers warn about lumping all Hispanic subgroups (e.g., Cubans, Mexicans, Puerto Ricans) under the label "Hispanic" (Marín & Marín, 1991). Indeed, not distinguishing among subgroups prevents examination of meaningful intergroup differences like those concerning the effectiveness of support networks.

Westman (1992) suggested that organizations provide their managers with resources such as authority, prestige, pay, and power that enable them to cope appropriately. Perceived control, defined as the ability to control important outcomes by influencing events and others, has been found to moderate the relationship between work stressors and job satisfaction (Tetrick & LaRocco, 1987). The advantages associated with high rank or high pay (e.g., decision latitude) should also facilitate coping with perceived discrimination. Hence,

Hypothesis 4: The effects of perceived discrimination on employee outcomes will be moderated by salary level: perceived discrimination will affect those with high salaries less than those with low salaries.

Age moderates the effects of job stressors on life satisfaction, with older employees seemingly less affected by job stressors than younger ones (Mayes,

Barton, & Ganster, 1991). Employees appear to gain satisfaction from areas other than work at the stabilization and maintenance stages of their careers (Rosenbaum, 1979). Research on career stages suggests that experienced individuals have learned to deal with the most challenging aspects of their jobs and to secure their positions within a company (Slocum & Cron, 1985). In a similar vein, being the recipients of discrimination for a prolonged period should teach individuals to cope with this work stressor. Thus,

Hypothesis 5: Job experience will moderate the effects of perceived discrimination on employee outcomes: experienced employees will be less affected by perceived discrimination than novices.

METHODS

Sample and Procedures

Six teams of four to five survey administrators were formed by college seniors. A doctoral student supervised each team. Survey settings (shopping malls and offices of the driver's license bureau) that had previously yielded representative samples of area Hispanics in research on jury selection were intentionally selected and assigned to teams (Moran, Cutler, & De Lisa, 1994). Survey teams reported that, depending on location, 30 to 60 percent of the individuals asked to participate declined. All teams had at least four individuals who were fluent in Spanish, and all team members were fluent in English. Of a total of 263 surveys collected, 152 were from employed Hispanic individuals. After we had discarded incomplete responses, 139 respondents remained. Respondents were assured that their responses would be anonymous and used only for research purposes. Approximately 40 minutes were required to complete the instrument. The survey process lasted approximately four weeks. The occupations with the most numerous incumbents were real estate agent, salesperson, secretary, and store manager.

Surveys were written in either Spanish or English and respondents chose the version they preferred. The Spanish version was chosen by 36 percent of the respondents. Because usages differ across Spanish-speaking countries, we had a panel of four bilingual individuals from four distinct Hispanic backgrounds—Chilean, Cuban, Puerto Rican, and Spaniard—develop Spanish translations, instructing them to use Spanish that could be understood regardless of an individual's national origin. We then compared back-translations (Brislin, 1970) until we achieved consensus on a Spanish version.

The target population was employed Hispanics in Dade County, Florida. The population of Dade County, which encompasses the Miami metropolitan area, is 44 percent Hispanic. This type of large, urban concentration is a typical example of the distribution of Hispanics in the United States. A total of 139 employed respondents who endorsed "Hispanic" as their ethnicity were included in the analyses. This sample size provided adequate statistical power for detecting even small effect sizes, given the number of predictors

employed in the regression analyses (Cohen, 1992). The respondents' median salary was between \$15,000 and \$20,000. Women comprised 59.6 percent of the sample. The median age range was between 30 and 39. Cuban-Americans comprised 60 percent of the respondents, and 41 percent were born outside of the United States. A point-by-point comparison of sample and population demographics obtained from the CD-ROM version of the 1990 U.S. Census Data suggested that our sample was fairly representative of the Hispanic population of Dade County despite its having more divorced individuals, more individuals whose parents were born outside of the United States, a slightly lower median age, and a higher education level.¹

Measures

Items for each scale were added to form a single score. Scale anchors ranged from "I strongly disagree" (1) to "I strongly agree" (5). *Role conflict* (e.g., "I receive incompatible requests from two or more people") and *role ambiguity* (e.g., "I know exactly what is expected of me") were measured with House and Rizzo's scales (1972). *Perceived discrimination* was gauged with 10 items selected from a 24-item scale measuring acculturative stressors and perceived discrimination (Mena, Padilla & Maldonado, 1987). The words "at work" were added to all items because of our focus on work discrimination. Initially, 14 of the 24 items were independently selected by at least three of four doctoral students as capturing perceived discrimination in work settings. A faculty member and a reviewer of this manuscript later examined the relevance of these 14 items to the construct of perceived discrimination. We kept the 10 items selected by both of these judges (working separately) in the scale (Cronbach's $\alpha = .87$; see the Appendix for the items).² Support for this scale's unidimensionality was suggested by (1) the screeplot of eigenvalues obtained from a factor analysis (4.85, 0.94, and 0.88 for the first, second, and third root, respectively), (2) a parallel analysis (Lautenschlager, 1989) indicating that the eigenvalues for roots other than the first one were the result of essentially random variation, (3) factor loadings of at least .41 for all items, and (4) a confirmatory factor analysis posing a single underlying trait conducted via LISREL VI (Jöreskog & Sörbom, 1985; $\chi^2_{35} = 82.49$, $p < .01$, GFI = .91). *Organizational commitment* was indexed with a 9-item scale from Cook and Wall (1980; an example is "I am proud to be able to tell people who it is I work for"). *Job satisfaction* was measured with the 3-item scale employed in the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1979; e.g., "All in all, I am satisfied with my job"). *Work tension* was assessed with a 7-item scale from House and Rizzo (1972; e.g., "I work under a great deal of tension"). Information on gender, ethnic subgroup, number of dependents, age, and other demographic indicators was gathered at the end of the survey. An item indicating whether

¹ The point-by-point comparison is available from the senior author.

² The Spanish version of the scale is available from the senior author.

a respondent grew up in the United States had the following endpoints: "I grew up only outside the continental U.S." (1) and "I grew up only in the continental U.S." (5). Salary level was gauged with an item ranging from "less than \$15,000" (1) to "more than \$50,000" (5). Job experience ranged from "less than 2 years" (1) to "more than 20 years" (5).

RESULTS

Incremental Effects of Perceived Discrimination on Employee Outcomes

Table 1 presents descriptive statistics and internal consistency reliabilities for each variable. Zero-order correlations (Table 2) indicated that perceived discrimination was related in the expected direction to the three employee outcomes considered here. To evaluate whether these associations held above and beyond associations with other stressors and thus test Hypothesis 1, we computed hierarchical regression analyses. Table 3 shows the results.

Gender (a dummy-coded variable) and number of dependents were controlled for in the first step of the hierarchical regression analyses. These control variables represented potential confounds because (1) Hispanic women may perceive discrimination as occurring because of gender as opposed to ethnicity and (2) Hispanics tend to have large families, so they may be subject to more work stressors (e.g., work-family conflict) than members of other groups. Role ambiguity and role conflict accounted for a statistically reliable portion of the variance in employee outcomes at step 2 (as indicated by the *F*-change tests). When perceived discrimination was entered at step 3, a significant increase in *R*² emerged across all employee outcomes.

Perceived Discrimination and Coping Resources

Each potential moderator of the perceived discrimination-employee outcome relationship was separately entered at step 4, followed by cross-

TABLE 1
Descriptive Statistics and Reliabilities^a

Variable	Mean	s.d.	α	Possible Range	Actual Range
1. Women	0.60	0.49		0-1	0-1
2. Number of dependents	1.88	1.21		1-5	1-5
3. Role ambiguity	19.85	3.76	.72	5-25	8-25
4. Role conflict	22.47	7.29	.82	8-40	8-38
5. Organizational commitment	32.47	6.37	.83	9-45	15-45
6. Job satisfaction	11.63	3.25	.83	3-15	3-15
7. Work tension	19.01	6.73	.83	7-35	7-35
8. Perceived discrimination	18.92	7.69	.87	10-50	10-48
9. Grew up in U.S.	3.34	1.47		1-5	1-5
10. Cuban	0.61	0.49		0-1	0-1
11. Salary	2.52	1.20		1-5	1-5
12. Job experience	2.05	1.16		1-5	1-5

^a *N* = 139.

TABLE 2
Pearson Zero-Order Correlations^a

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Woman											
2. Number of dependents	-.16										
3. Role ambiguity	-.15	.13									
4. Role conflict	.06	-.16	.34**								
5. Organizational commitment	-.11	.15	-.57**	-.34**							
6. Job satisfaction	-.18	.16	-.51**	-.31**	.66**						
7. Work tension	.07	-.13	.34**	.52**	-.30**	-.42**					
8. Perceived discrimination	.05	.11	.20*	.34**	-.25*	-.28**	.37**				
9. Grew up in U.S.	.03	-.15	.25*	-.04	-.02	-.14	.02	-.21*			
10. Cuban	.04	.17	-.01	-.21*	.14	.07	-.05	-.13	.30**		
11. Salary	-.18	.39**	-.19	-.20*	.32**	.27**	-.04	-.03	-.02	.13	
12. Job experience	-.12	.25*	-.24*	-.01	.25*	.15	.08	.09	-.14	.15	.49**

^a $N = 139$.

* $p < .05$

** $p < .01$

TABLE 3
Results of Hierarchical Regression Analyses^a

Step	Predictor ^b	ΔF	df	R^2	Adjusted R^2	ΔR^2	β
Dependent variable:							
Organizational commitment							
1	Number of dependents	2.38	2, 136	.03	.02	.03	.13
	Woman						-.10
2	Role conflict	33.08**	2, 134	.35	.33	.33	-.16*
	Role ambiguity						-.50**
3	Perceived discrimination	3.52*	1, 133	.37	.35	.02	-.15*
4	Grew up in U.S.	1.60	1, 132	.37	.34	.01	.09
5	PD \times GU	4.33*	1, 131	.39	.36	.02	.46*
4	Cuban	1.29	1, 132	.37	.34	.01	-.08
5	PD \times Cuban	0.10	1, 131	.37	.33	.00	.06
4	Salary	9.08**	1, 132	.40	.38	.03	.23**
5	PD \times salary	0.53	1, 131	.41	.38	.01	.17
4	Job experience	5.87*	1, 132	.40	.36	.03	.18*
5	PD \times JE	4.64*	1, 131	.42	.38	.02	.49*
Job satisfaction							
1	Number of dependents	3.94*	2, 136	.05	.04	.05	.13
	Woman						-.17*
2	Role conflict	23.46**	2, 134	.30	.28	.25	-.14
	Role ambiguity						-.44**
3	Perceived discrimination	4.90*	1, 133	.32	.30	.02	-.17*
4	Grew up in U.S.	0.88	1, 132	.33	.30	.00	-.07
5	PD \times GU	1.51	1, 131	.34	.30	.01	-.28
4	Cuban	0.01	1, 132	.32	.29	.00	.01
5	PD \times Cuban	0.77	1, 131	.32	.29	.00	.17
4	Salary	3.86*	1, 132	.34	.31	.02	.18*
5	PD \times salary	6.74**	1, 131	.37	.34	.03	.66**
4	Job experience	0.77	1, 132	.33	.30	.00	.07
5	PD \times JE	2.57	1, 131	.34	.31	.01	.39
Work tension							
1	Number of dependents	0.93	2, 136	.02	.00	.02	-.12
	Women						.07
2	Role conflict	29.41**	2, 134	.31	.29	.29	.47**
	Role ambiguity						.17*
3	Perceived discrimination	7.41**	1, 133	.35	.32	.04	.21**
4	Grew up in U.S.	0.16	1, 132	.35	.32	.00	.03
5	PD \times GU	1.25	1, 131	.36	.32	.01	-.25
4	Cuban	0.80	1, 132	.35	.32	.00	.07
5	PD \times Cuban	5.64**	1, 131	.38	.35	.03	-.45**
4	Salary	9.99**	1, 132	.39	.37	.04	.24**
5	PD \times salary	7.94**	1, 131	.43	.40	.04	-.68**
4	Job experience	3.87*	1, 132	.37	.34	.02	.15*
5	PD \times JE	1.05	1, 131	.37	.34	.00	-.24

^a Steps 4 and 5 were repeated for each potential moderator.

^b PD = perceived discrimination; GU = grew up in U.S., JE = job experience.

* $p < .05$

** $p < .01$

products or interactions among perceived discrimination and the corresponding moderator at step 5 (Table 3). We thus repeated steps 4 and 5 four times, one for each potential moderator. A separate examination of moderators was preferred because (1) the subjects-to-variables ratio in our sample did not allow a reliable test of each moderator with the other moderators held constant (Cohen, 1992) and (2) potential moderators were not completely independent, making their relative contributions difficult to disentangle (Wainer, 1976). We also computed omnibus regressions by entering all potential moderators at step 4 and all potential interactions at step 5. The results are not reported here because they were practically identical to those obtained in the separate regression analyses. The results of the omnibus regressions, however, ruled out Type I error as an alternative explanation for the interaction effects.

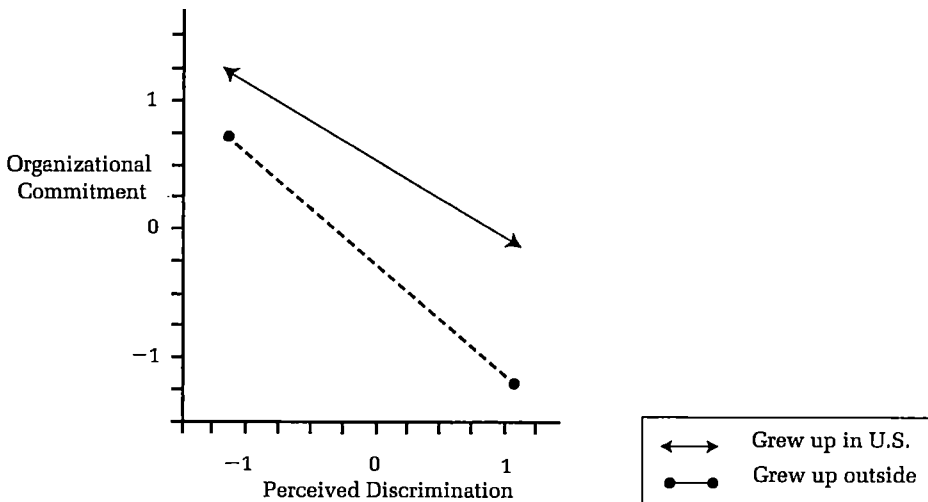
An inspection of the *F*-tests associated with the change in R^2 due to the interactions provided partial support for the remaining hypotheses: the extent to which a person grew up in the United States moderated the association between perceived discrimination and organizational commitment (Hypothesis 2); a Cuban background (a dummy-coded variable) moderated the relationship between perceived discrimination and work tension (Hypothesis 3); salary moderated the association between perceived discrimination and both job satisfaction and work tension (Hypothesis 4); and job experience moderated the relationship between perceived discrimination and organizational commitment (Hypothesis 5). Plots of the separate regression lines (Aiken & West, 1993) confirmed that interactions followed the expected direction: growing up in the United States buffered the effects of perceived discrimination on organizational commitment as predicted in Hypothesis 2 (see the sample plot of regression lines in Figure 1), membership in the demographically dominant Cuban subgroup buffered the effects of perceived discrimination on work tension (Hypothesis 3), a high salary buffered the effects of perceived discrimination on both job satisfaction and work tension (Hypothesis 4), and job experience moderated the effects of perceived discrimination on organizational commitment (Hypothesis 5).

To evaluate the threat of common method variance, which may be exacerbated by the cross-sectional design employed here (Salancik & Pfeffer, 1978; Spector, 1987), we employed a confirmatory factor-analytic approach to Herman's one-factor test (McFarlin & Sweeney, 1992). Using LISREL VI and entering all self-report scales of stressors and employee outcomes, we calculated a one-factor model showing poor goodness of fit ($\chi^2_9 = 47.99$, $p < .05$, GFI = .76).

DISCUSSION

The central hypothesis of the present study is that a culturally relevant work stressor, perceived discrimination, contributes to employee outcomes above and beyond other work stressors. Analyses of incremental effects of perceived discrimination on organizational commitment, job satisfaction, and work tension supported this hypothesis. In addition, we predicted that

FIGURE 1
Comparison of Respondents Who Grew Up in the United States and Others



growing up in the United States, having a Cuban background, receiving a high salary, and having job experience would buffer the effects of perceived discrimination on employee outcomes. Each moderator interacted with perceived discrimination to affect at least one of the employee outcomes considered.

Our results should alert managers to the peril of employees' attributing differences in treatment to their ethnicity. Management decisions and communications with employees should be carefully shaped to prevent perceptions of differential treatment. Because perceived discrimination has incremental effects on outcomes that have been linked to behaviors like quitting (Hom, Caranikas-Walker, Prussia, & Griffeth, 1992), it may be an apt criterion for evaluating the success of diversity management programs.

The interactions suggested resources that may enhance people's ability to cope with perceived discrimination. Hispanics who grew up in the United States, who were members of the most numerous ethnic subgroup, and who had high pay and job experience appeared the least affected by this work stressor. The inconsistent buffering effects across all outcomes found here were in line with past research (Cohen & Wills, 1985; Osipow & Davis, 1988). Partial explanation for the inconsistency might be (1) our sample's offering insufficient statistical power to detect small interactions between continuous variables (according to Aiken and West, 1993, upwards of 400 cases are sometimes needed) and (2) the different natures of the employee outcomes assessed. The match between the content of buffers and outcomes might explain these inconsistent effects. For instance, moderation of primarily

organizational outcomes like organizational commitment may be most likely when work-related buffers (e.g., job experience) are present, whereas moderating effects on health-related outcomes like work tension might be best achieved by extra-work buffers like support from one's ethnic subgroup.

Even though Dade County probably provides a typical example of a large, urban, U.S. concentration of Hispanics, generalization of our results to other settings should proceed cautiously. For instance, our sample seemed slightly younger and better educated than the target population. Although less-privileged Hispanics may perceive higher levels of discrimination than the ones detected here, some low-income workers, such as those employed in agriculture, may perceive even less discrimination because of their limited contact with outsiders. In fact, our results might underestimate the effects of perceived discrimination because role conflict and role ambiguity, whose effects were partialled out, may be confounded with perceived discrimination (one's assigned role may be influenced by one's ethnicity). By contrast, our results may overestimate some buffer effects. Support from one's ethnic subgroup, for example, may be of less value where the subgroup is not as well settled as the dominant subgroup is in Dade County.

The threat of common method variance was curtailed by the results of the one-factor test and by the demographic nature of the moderators, which are less prone to percept-percept inflation than attitudes or psychological states (Crampton & Wagner, 1994). However, reverse causality paths could not be ruled out by the cross-sectional design. Longitudinal and experimental research is needed to draw causal inferences.

The incremental and adverse effects of perceived discrimination on employee outcomes underscore the need to account for stressors associated with employee ethnicity, which have remained virtually ignored in the work stress literature. Our findings reveal the central role of perceived discrimination in the process of work stress through which ethnicity influences employee outcomes. Continued research on the managerial practices and organizational climates that determine perceived discrimination should serve to inform the design and implementation of diversity management programs intended to prevent this work stressor.

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APPENDIX

Perceived Discrimination Scale^a

1. At work, I feel uncomfortable when others make jokes or negative commentaries about people of my ethnic background.
2. At work, I sometimes feel that my ethnicity is a limitation.
3. At work, many people have stereotypes about my culture or ethnic group and treat me as if they were true.

4. At work, people think I am unsociable when in fact I have trouble communicating in English.
5. At work, I sometimes feel that people actively try to stop me from advancing because of my ethnic origin.
6. At work, it bothers me when people pressure me to assimilate.
7. At work, I do not get enough recognition because I am different.
8. My accent is a limitation at work.
9. At work, I feel that others exclude me from their activities because of my ethnic background.
10. At work, people look down upon me if I practice customs of my culture.

^a Responses ranged from "I strongly disagree" (1) to "I strongly agree" (5).

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CORPORATE POLITICAL STRATEGY AND FOREIGN COMPETITION: THE CASE OF THE STEEL INDUSTRY

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An underplayed topic in the strategic management literature is firms' use of political strategies, such as lobbying the government for trade protection. This study developed and tested a simple model examining the magnitude, scope, and timing of U.S. steel firms' use of political strategies to address U.S. trade policy. The findings showed that the industry's largest firms dominated the politics surrounding trade protection in order to capture expected benefits from trade protection or to postpone high downsizing costs. Firms engaged in certain political strategies not when import competition was the greatest but when domestic demand was weak.

Why do domestic firms become involved in American trade politics? The intense competition from foreign companies in numerous sectors of the U.S. domestic market (Destler, 1992; Tyson, 1992) results from many factors besides the relatively open trade regime of the U.S.¹ (Baldwin, 1985; Destler, 1992). However, the U.S. government, through the enactment of trade (and other) policies, can fundamentally alter the domestic market structure of an industry (Stigler, 1971), which in turn can have differential effects upon the profitability of the firms within it (Gilligan, Marshall, & Weingast, 1990; Hughes, Magat, & Ricks, 1986; Mitnick, 1993; Rose, 1985). The possibility of governmental intervention into a market can be a powerful enticement for domestic firms that are affected adversely by foreign competition to elicit political activities aimed at procuring governmental protection (Baysinger, 1984; Boddewyn, 1988).

This study examined the political strategies of U.S. firms aimed at protecting the domestic market from foreign competition. Political strategies can be viewed as a competitive tool for firms in meeting the challenge from international (and domestic) competitors, because governmental outcomes

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¹ Some scholars have criticized the prevalence of nontariff barriers in U.S. trade policy. See, for example, Boltuck and Litan (1991), Gilpin (1987: 394–408), Finger and Murray (1990), and Rugman and Gestrin (1991).

can affect the size and cost structure of an industry (Gale & Buchholz, 1987; Marcus, 1987; Mitnick, 1993; Stigler, 1971; Wood, 1986). Corporate political strategies are a pattern in a stream of managerial decisions that represent an integrated set of activities within a firm intended to produce public policy outcomes favorable to the firm's economic survival and continued success (Keim & Baysinger, 1988: 171–172). Boddewyn (1988) pointed out that the government is not exogenous to the market and that firms constantly function as both economic and political actors. For firms that are encumbered by high exit barriers (Harrigan, 1980), political strategies may represent one of the best ways to face the challenges of foreign competitors. The results of this study suggest that domestic firms strategically used the government's control over access to the U.S. market as a political tool to stabilize prices in a declining market by taking actions against the alleged unfair trade practices of foreign firms, such as subsidization and dumping (Barnett & Schorsch, 1985).

But within a politically active industry, what determines whether a particular firm devotes its resources toward procuring trade relief for the industry? Investment in public policy differs from other types of strategic investment, such as investment in new plant and equipment, in that the benefits are seldom fully appropriated by the investing firm, but spill over to other firms (Teece, 1988). These benefits are thus "collective goods." Politics is a "non-proprietary setting where individual agents do not always see the full benefit and cost of their decisions" (Tollison, 1982: 589 [quoted in Boddewyn, 1988: 346]). The collective goods nature of trade protection should discourage most firms from taking political actions (Olson, 1971). Does this mean that only large firms will try to provide trade protection for this industry as the collective action theory posits, or will other firm-level strategic and organizational factors be important in determining which firms take action? Furthermore, how do external economic factors, particularly the intensity of import competition and the condition of domestic demand, influence the timing of political trade strategies? In this study, I developed and tested a model of corporate political strategy that addresses how these factors influence a firm's decision to become politically active.

The context of this investigation is the U.S. carbon steel industry from 1976 through 1989, a period in which this sector faced considerable import pressure and engaged in a massive amount of political activity against imports. More than firms in any other industry, carbon steel firms lobbied Congress and filed antidumping and countervailing duty petitions at the International Trade Administration of the Department of Commerce and at the U.S. International Trade Commission in order to raise barriers against imported steel in the American market (Boltuck & Litan, 1991: 3).

The findings of the econometric analysis revealed two effects relating to corporate political strategies; one was found consistently across time, and the second varied during the period of investigation. First, across time, the largest firms consistently were the most politically active. This finding may reflect beliefs on the part of the managers of the large firms that they could expect a net economic benefit from undertaking political strategies. These

large firms may also have been using political strategies as a substitute for their failing competitive strategies in order to gain some temporary relief from foreign competition. Second, the type of political activity changed across time. Domestic demand, not import penetration, was very significant in predicting whether firms would file unfair trade petitions, but import penetration was an important influence on congressional lobbying. This pattern may have reflected the beliefs of steel company managers that during a period of severe recession they should grasp any government policy instrument that was available, regardless of whether or not it was meant for this purpose. Longer-term actions, however, such as lobbying Congress, were influenced by the level of imports in the U.S. market.

POLITICAL INVOLVEMENT IN TRADE

This study investigated the two most critical areas of political involvement regarding trade: (1) actions aimed at Congress, from which trade protection is sought and (2) actions aimed at the International Trade Administration and the U.S. International Trade Commission, from which administrative relief is sought.² Congress has the power to authorize trade arrangements, although it has delegated much of this power to the executive branch (Destler, 1992). The International Trade Administration and the U.S. International Trade Commission are the two agencies charged with implementing (under statutory guidelines and time frames) much of U.S. trade law (Boltuck & Litan, 1991).

The decision of a company's management to direct corporate resources toward political lobbying is an important one. First, political lobbying is expensive. For example, according to steel industry trade lobbyists, a firm must spend at least \$1.5 million for legal and economic consultants for each unfair trade petition filed, an amount that excludes associated in-house legal, accounting, and executive expenditures. Second, the use of political strategies is becoming more complex and contested for firms than it was previously, because of (1) the decentralization of power into the subcommittees of Congress that began in the 1970s, (2) the availability of electronic technology for gathering and disseminating information, and (3) the large number of political professionals in Washington (Keim & Baysinger, 1988; Schlozman & Tierney, 1983). Third, the public nature of political activities poses a degree of risk to a company. A firm may be hesitant to risk its market position or reputation by being perceived as "greedy" in the policy arena (Salamon & Siegfried, 1977; Zardkoohi, 1985). The significance of a decision to enter

² Firms in the steel industry rarely pursued protectionist relief through escape clause actions. The escape clause [section 201 of the Trade Act of 1974] provides for relief to industries that can prove to the U.S. International Trade Commission that imports were a "substantial cause, or threat thereof, of material injury" [Destler, 1992]. Over this period, only one escape clause petition was filed, by Bethlehem Steel and the United Steel Workers of America in 1984. For purposes of the empirical examination, this escape clause action will not be included with the antidumping and countervailing duty petitions.

the political arena suggests that companies consciously and calculatingly (Ghemawat, 1991) choose either to enter or refrain from doing so.

A MODEL OF CORPORATE POLITICAL STRATEGY

Political actions represent one strategy among a set of options that a firm considers in responding to foreign competition. In this section, I develop a simple model of corporate political strategy that draws upon three literatures: collective action theory, organizational theory, and competitive strategy. The underlying premise of the model is that managers of firms exercise strategic choice in determining whether or not and in what domain to become politically active (Child, 1972; Ghemawat, 1991). Both internal firm factors and external ones influence this strategic choice. Corporate political strategies are intended to align the external environment and the internal capabilities of the firm (Galbraith & Kazanjian, 1986). The behavioral assumptions underlying the theory of corporate political involvement are that managers operate in a world of imperfect information and are subject to "bounded rationality," in that they make "satisficing" decisions because of organizational constraints and cognitive limitations. Additionally, in political decisions, managers may pursue both economic and noneconomic (e.g., ideological) goals (Moe, 1980). Overall, because of imperfect information, imperfect intrafirm decision-making processes, and the pursuit of both economic and noneconomic goals, the political strategies of firms are likely to exhibit heterogeneity (Lenway & Rehbein, 1991; Moe, 1980; Yoffie, 1987).

However, corporate political strategy has a unique characteristic that makes it a special type of strategic choice. Corporate political strategies are aimed at public institutions that have the power to produce public policy outcomes.³ That is, the resultant public policy is a public or collective good. Collective goods have the properties of inexhaustibility and inexcludability, so that one firm cannot enjoy exclusive benefits, although benefits may be shared differentially across firms (Gilligan et al., 1990; Hughes et al., 1986; Mitnick, 1993; Rose, 1985; see Stigler [1974] for the concept of quasi-public goods). Additionally, using a cost-benefit calculus for political strategies is difficult because many elements, including political actions by other actors and the receptiveness of governmental actors to interest group pressures, affect the benefits, which are widely separated from the cost of political action to a firm (Sethi, 1982). Therefore, because of the public nature of governmental policy outcomes, any theory of corporate political strategy must have a foundation based upon collective action theory.

A premise of collective action theory (Olson, 1971) is that a firm's incentive for political action is determined by its expected private net benefit. A firm will calculate a priori the costs and benefits it expects from undertaking

³ U.S. law also contains private bills. These deal with individual matters, such as claims against the government, immigration and naturalization cases, and land titles (Davidson & Oleszek, 1990: 312).

or refraining from political activity and pursue the option that maximizes its net benefits. Additionally, collective action theory focuses on the problem of collective goods as the objective of a firm's political actions. Some firms can free ride on the efforts of politically active firms and enjoy the benefits of a public policy even if they have not devoted resources toward its establishment (Olson, 1971: 34–35). Free riding entails a firm's strategic decision that other firms will have stronger incentives than it has itself to underwrite the cost of providing a collective good and that the private cost to the non-politically active firm will exceed any benefits it is likely to receive.

The relative size of a firm provides one indication of its incentive to participate in providing a collective good for its industry.⁴ In Olson's framework, the returns from a collective good will increase with firm size. Given an industry heterogeneous in terms of firm size, the largest firms will expect a priori to gain the most from the public good. Additionally, because political action entails some degree of cost, it is likely that only the largest firms will receive sufficiently high economic returns from the imposition of a public policy to justify the costs of their involvement (Mann & McCormick, 1980: 304). In contrast, small firms will free ride, because the substantial costs involved in political participation will exceed any benefits that the policy might confer (Mann & McCormick, 1980; Yoffie, 1987). Therefore, large firms have a strong incentive to be politically active, and small firms will free ride.

Hypothesis 1: A firm's political involvement will be positively related to its relative size in the industry.

It follows from the collective action literature that corporate diversification may also influence a firm's political strategy. Diversification is often classified as vertical, related, or unrelated (Ramanujam & Varadarajan, 1989). Vertical diversification can achieve efficiencies for a firm through the relatedness of businesses in the value chain (Harrigan, 1985). Related diversification implies that synergy can be realized across business units through economies of scope or the sharing of resources and capabilities across businesses (Hoskisson, 1987). Unrelated diversification is often associated with risk pooling and intrafirm capital allocation, but operating coordination across business units is minimal (Dundas & Richardson, 1982).

The extent of diversification is likely to have an effect on the level of a firm's political strategy. The less related the range of businesses in which a firm competes, the greater the range of public policies that can affect it (Epstein, 1969). Multibusiness firms have a wide and complex range of trade interests and thus likely will be concerned with broad trade policy, and less

⁴ Olson (1971: 22–52) stated that the characterizations of a given group, such as size, homogeneity, and history, will be important in determining if any or all members will organize for political action. Coordinating mechanisms, such as industry trade associations, can facilitate collective action. For the steel industry, the primary trade association, the American Iron and Steel Institute, was involved in some political activity, but individual firms carried out most of the political actions.

diversified firms will tend to favor narrow, sector-specific policy (Bauer, Pool, & Dexter, 1972: 126, 228). This statement assumes that widely diversified firms are unlikely to have synergies across business units that would motivate them to take a unified stance in a narrow policy area. Additionally, widely diversified firms may have complex organizational and governance structures (Hoskisson, 1987; Hoskisson & Hitt, 1990) that may allow business unit managers the discretion to pursue their own political strategies irrespective of overall corporate interests. Although this possibility exists, it seems likely that vertically integrated and related-diversified firms are more likely to support a sector-specific public policy than unrelated-diversified firms. In other words, a firm that operates wholly in a single line of business or that has a high degree of vertical integration or related diversification is likely to anticipate greater benefits from a sector-specific public policy than a firm with a wide range of unrelated business. For the present study, corporate political involvement entails a firm's activities aimed at achieving sector-specific policy outcomes, such as trade policy for a single industry. Thus,

Hypothesis 2: A firm's political involvement will be positively related to the extent of its related business diversification.

The collective action literature may be an overly narrow basis upon which to develop a theory of corporate political involvement. Collective action is premised upon assumptions of perfectly rational behavior in a world of complete information (Olson, 1971). As stated previously, managers of firms face constraints in developing strategic choices. The assumptions of imperfect information and bounded rationality imply that the sole focus on the expected net benefits outcome from collective action theory may be too simplistic or even erroneous. Decisions about corporate politics may be subject to wider influences than simply expected net benefits. Thus, the model of corporate political strategy presented here includes the effects of two internal factors and two external factors on corporate political strategy.

Organizational structure influences the decisional premises and routinizes behaviors of a firm's managers (Schwenk, 1989). The formal hierarchy of a firm creates organizational "bounds" on political decision making. The hierarchy, or organizational structure, is the formal segmentation of work into roles, such as production and marketing (Galbraith & Kazanjian, 1986). There may be significant costs to altering an organizational structure (Cyert & March, 1963). Since these structures are long lived, one may observe a firm engaging in activities that persist without regard to the demands placed upon it by external stakeholders (Huff, Huff, & Thomas, 1992; Nelson & Winter, 1982). This study investigated how one type of organizational structure, dedicated organizational political units, influences corporate political involvement.

Many firms greatly increased their standing capacity for political action during the 1970s and 1980s (Yoffie, 1987). The effectiveness of political activities is often difficult to evaluate (Boddewyn, 1988; Keim & Baysinger,

1988; Sethi, 1982). Destler, Odell, and Elliott observed the following: "Now that all these political law offices and representatives have been established, they will be attempting to generate work on some issue. . . . Even if the international market conditions should change, observed political pressure . . . may not decline as much as the economic change would imply" (1987: 71). For the present study, the organizational structure of interest dedicated to politics is a firm's Washington, DC, office. Hence,

Hypothesis 3: A firm's political involvement will be positively related to the existence of dedicated organizational political units (structures) within it.

The availability of resources may also affect a firm's ability to engage in politics. Keim and Baysinger (1988) stated that securing and maintaining organizational resources are critical for implementing successfully political strategies. A firm's "excess" resources are sometimes referred to as organizational slack (Bourgeois, 1981; Cyert & March, 1963; Singh, 1986). Organizational slack is the cushion of actual or potential resources that allows an organization to alter strategies in response to internal or external pressures for adjustment (Bourgeois, 1981). The present study adopts Singh's (1986) view that a firm requires a certain level of resources to engage in political actions (but see Bourgeois [1981] and Hambrick and D'Aveni [1988], for counterarguments).

Yoffie (1987) applied the theory of organizational slack in his study of corporate political strategy. Contradicting the collective action literature, he argued that the creation of slack resources is a critical issue and will have an important effect on a firm's choice of a political strategy. Firms that are active in the political process are likely to have sufficient slack resources, and firms lacking slack will take a lesser role. Lenway and Rehbein (1991), using return on assets to measure slack, provided empirical evidence in support of Yoffie's prediction. I hypothesized the same relationship.

Hypothesis 4: A firm's political involvement will be positively related to the availability of slack resources within it.

The external environment that a firm faces may affect the extent and type of its political action. Just as firms attempt to respond to their external environments with competitive strategies, they may attempt to do so through political strategies (Boddewyn, 1988; Carter, 1990; Hrebiniak & Joyce, 1985). Firms may direct efforts toward solving specific problems caused by their external environments (Baysinger, 1984; Hrebiniak & Joyce, 1985; Miles & Cameron, 1982) and may ultimately change strategies on the basis of environmental conditions (Zajac & Shortell, 1989). Firms facing a hostile economic environment may use political strategies to enable them to earn short-run revenues needed to achieve a turnaround. The volatility of the economic environment may also affect the likelihood that governmental decision makers will support the industry. This study investigated the intensity of two external economic factors on corporate political involvement. The first involves heightened competitive pressures from foreign imports, which is analogous to an increase of supply in the domestic market. The second involves

changes in consumption in the domestic market, particularly downward swings in domestic demand. It is expected that firms will undertake political strategies in an attempt to rectify supply increases from foreign firms (i.e., imports) and demand decreases due to domestic consumption patterns. Thus,

Hypothesis 5a: A firm's political involvement will be positively related to the level of import penetration into its industry.

Hypothesis 5b: A firm's political involvement will be negatively related to the level of domestic demand for its industry's products.

In summary, the model of corporate political strategy set forth here demonstrates several influences on a firm's strategic choice. First, because of the collective goods nature of public policy, it is expected that the largest firms will have the greatest incentives to engage in political action since they enjoy the highest expected net benefits and also are sufficiently large to overcome the initial fixed costs of political action. Second, because firms differ in their extent of diversification, it is expected that firms with a preponderance of their businesses in a single sector will exhibit higher levels of political involvement than widely diversified firms. Use of these factors implies that firm decision making regarding politics is based upon rational cost-benefit calculation under informational certainty. If those assumptions are relaxed, other factors internal and external to firms may affect this political calculus. Organizational structure, in the form of a dedicated in-house political relations unit, is expected to positively enhance the likelihood of corporate political involvement. Because political involvement entails a certain base cost, it is expected that firms with sufficient slack resources will be more likely to undertake political actions than resource-deficient firms. Finally, because governmental policy makers are influenced in part by economic conditions, it is expected that firms will respond to certain conditions in the external environment with political strategies. High levels of foreign import competition, which increase the overall supply in the domestic market, and low levels of consumption—which decrease the demand in the domestic market—should trigger firms' political involvement.

METHODS

To test the hypotheses developed above, I established a multiple regression model. The following sections describe the data, the model, and the estimation techniques. Table 1 reports the variables and their operational definitions.

Data

Data for firm-level and industry-level political and financial variables were gathered from primary and secondary sources for the period 1976–89. I conducted interviews with a number of steel company executives in the

TABLE 1
Variables Used and Summary Statistics^a

Variables	Mean	s.d.	Description
Petitions	1.43	5.17	Number of antidumping and countervailing duty petitions filed by a firm within a calendar year.
Testimony	0.29	0.63	Number of appearances at congressional hearings by firm representatives within a calendar year.
Market share	0.06	0.05	Firm steel shipments to total industry shipments in a calendar year.
Related diversification	0.84	0.23	Proportion of steel-related sales, calculated as the sum of steel sales plus steel-related sales divided by total corporate sales.
Washington office ^b			A dummy variable equal to 1 if there is a Washington, DC, lobbying unit, 0 otherwise.
Current ratio	1.75	0.49	A proxy for available unabsorbed slack. Current assets divided by current liabilities.
Debt/equity	0.69	0.69	A proxy for potential unabsorbed slack. Long-term debt divided by the book value of stockholder's equity.
Import penetration	0.20	0.03	The ratio of import sales to total domestic sales within a calendar year.
Domestic demand ^c	99,252	11,733	Annual level of domestic apparent consumption, measured as domestic shipments plus imports minus exports.

^a Each observation represents one company over one calendar year. Each variable has 179 observations.

^b Mean and standard deviation are not applicable.

^c In 1,000 tons.

governmental and public affairs areas. Unfair trade petition filings were found in the *Federal Register* and in U.S. International Trade Commission reports. Congressional hearings were located through the full version of the Congressional Information Services *Congressional Masterfile 1 and 2* and data were subsequently obtained from the full texts of the hearings. Financial and market share data were gathered from company 10-K and annual reports. Industry data were found in secondary sources, including reports from the American Iron and Steel Institute and the U.S. Department of Commerce Bureau of Economic Analysis.

Annual data were collected on 17 integrated carbon steel firms over the period 1976–89. This data set represents essentially the entire population of integrated carbon steel producers during this period. The 179 data points in the analysis reflect the exit from the industry by certain firms during the investigation period. During this period, American steel companies filed 140 antidumping and 135 countervailing duty petitions against alleged unfair trade practices of foreign steel producers and testified for protectionist relief before approximately 50 Senate and House hearings.

Model

The model consists of two equations, each of which takes the following form:

$$CPI = a + \beta_1 MS + \beta_2 RD + \beta_3 WSH + \beta_4 CR + \beta_5 DE + \beta_6 IP + \beta_7 DD + e,$$

where

CPI = the corporate political involvement of a firm (either petitions or testimony),

MS = the market share of the firm,

RD = related diversification,

WSH = a dummy variable for the existence of a Washington, DC, lobbying office,

CR = the current ratio (current assets over current liabilities),

DE = long-term debt over shareholder's equity,

IP = import penetration as a percentage of apparent domestic consumption,

DD = the level of domestic steel demand,

and

e = a random error term with an expected value of zero.

Estimates

An examination of the residuals and the Breusch-Pagan chi-square (Breusch & Pagan, 1979) from the ordinary-least-squares (OLS) regression suggested the presence of heteroscedasticity. Therefore, I used weighted least squares (WLS) to estimate the model parameters. WLS provides a more efficient estimate of the parameter and standard error than OLS under these conditions (Weisberg, 1985).⁵ There were some concerns regarding collinearity with the models. The primary concern stemmed from the relationship between domestic consumption and import penetration, variables measured in such a way that they were mathematically related (see Table 1). The consequences of collinearity are that the standard errors might be overestimated for domestic consumption and import penetration and that the signs might change with the inclusion or exclusion of each variable. Table 2 reports the correlation matrix.

RESULTS

Table 3 reports the regression results. The models explain 22.65 and 23.57 percent of the variation in petition filings and congressional testimony, respectively.

Petition filings were positively and significantly related to level of market share. The largest firms in terms of market share were likely to file signifi-

⁵ White's procedure, which calculates the standard errors using asymptotically distributed estimates of the covariance, was used on the model of congressional testimony (Greene, 1990). The results from WLS and White's procedure were essentially equivalent.

In addition, although the Durbin-Watson statistics indicated that there was a possibility of autocorrelation, regressions of the residuals on their lagged values yielded insignificant results.

TABLE 2
Pearson Product-Moment Correlations^a

Variables	1	2	3	4	5	6	7	8
1. Petitions								
2. Testimony	.34***							
3. Market share	.29***	.42***						
4. Related diversification	-.01	-.08	.05					
5. Washington office	.21**	.20**	.66***	-.09				
6. Current ratio	-.16*	-.16*	-.24**	.07	-.17*			
7. Debt/equity	.02	.06	.10	-.04	.07	-.27***		
8. Import penetration	.17*	.20**	.04	-.23**	.08	.30***	.12	
9. Domestic demand	-.36***	-.03	-.02	.18*	-.05	.11	-.16*	-.43***

^a Each observation represents one company over one calendar year. Each variable has 179 observations.

* $p < .05$

** $p < .01$

*** $p < .001$

TABLE 3
Results of Regression Analyses: Trade Petitions and
Congressional Testimony^a

Independent Variables	Petitions		Testimony	
	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
Intercept	17.958	3.283**	-0.932	-1.403
Market share	25.044	2.774**	6.336	5.783***
Related diversification	1.132	0.718	-0.235	-1.230
Washington office	0.221	0.236	-0.215	-1.888 [†]
Current ratio	-0.911	-1.178	-0.005	-0.053
Debt/equity	-0.663	-1.292	0.003	0.055
Import penetration	-1.819	-0.149	3.871	2.608**
Domestic demand	-0.0002	-5.016***	0.000	1.053
<i>F</i>	7.152***		7.535***	
<i>R</i> ²	0.227		0.236	
Adjusted <i>R</i> ²	0.195		0.204	

^a *N* = 179 for both petitions and testimony.

[†] *p* < .10

* *p* < .05

** *p* < .01

*** *p* < .001

cantly more antidumping and countervailing duty petitions than the smallest firms in the steel industry. Related diversification, the current ratio, the debt to equity ratio, and having a Washington office were not statistically significant. Share of imports in the U.S. market did not affect petition filings significantly. However, the level of domestic steel demand was negatively and significantly related to the amount of petition activity. As demand fell for steel products, firms were inclined to file substantial numbers of unfair trade petitions.

Market share was positively and significantly related to congressional testimony. Interestingly, a firm's having a Washington office was negatively related to congressional testimony, although only at the .10 level of significance. The other strategic and organizational variables were not related to political action. As the significant coefficient for import penetration indicates, congressional testimony was the most sustained when imports were prominent in the domestic market. However, unlike the petition filings, domestic steel demand had no significant effect on the appearances of steel company representatives at congressional hearings.

DISCUSSION AND CONCLUSION

The results of the analysis of two types of firm political activity, petition filing and congressional testimony, shed new light upon theories of corporate political strategy. The results suggest that political strategies have two components: (1) constant effects over time and (2) temporal effects.

The first major finding of this study differentiates among firms with respect to the intensity of their political activities across the study period. Market share was the most important determinant of the levels of a firm's political involvement across time, a finding that has implications for both collective action and for strategic choice. This result provides strong support for the collective action component of the model, which predicts some level of political activity by the largest firms and free-riding behavior by smaller companies. The findings are bolstered by the fact that the inclusion or deletion of other firm-level strategic and organizational variables did not alter the sign or intensity of the influence of market share. This pattern suggests that despite the difficulties managers face in deciding about the efficacy of firms' political activities, the firms that expect to gain the most from the policy are the most likely to be politically active. However, whether managers have rationally calculated the incremental benefits of their political expenditures or have merely used firm size as a crude proxy of what they might receive cannot be deciphered from these results.

The finding of market share may indicate, furthermore, the importance of political involvement as a strategic choice (Baysinger, 1984). The firms with the largest market shares were typically the largest in terms of fixed assets and number of employees, both of which become liabilities when market conditions decline and put pressure on a firm for downward organizational adjustment (Harrigan, 1980). The largest firms in terms of market share also face the highest exit costs in the steel industry (Deily, 1988). Therefore, political strategies become even more valuable for these firms, because by stabilizing prices, the firms create a larger margin over shutdown operating levels.

Compared to market share, the strategic and organizational variables used in this analysis seemed less important as explanators of corporate political involvement. A Washington, DC, office was found to be negatively related to congressional testimony, although it was not significantly related to petition filings. Not surprisingly, all of the large integrated steel firms—except, until recently, the Inland Steel Company—had Washington lobbying offices, and the smaller firms did not. The negative relationship between congressional testimony and a Washington office might suggest a substitution effect for political strategies; firms without Washington representatives may have felt more compelled to send senior managers to formally testify before congressional committees since they lacked a constant Washington presence. However, this conclusion should be tempered because of the collinearity between a Washington office and market share.

The remaining firm-level strategic and organizational factors were not significant determinants of petition filing or congressional testimony. This lack of significance may be due to measurement error, collinearity, undeveloped theory in this area, or industry-specific effects. This study only touches on a few competitive strategies and organizational resources that might affect the magnitude and timing of a company's political activities. Furthermore, it measures these constructs in terms of only a few specific attributes for

which data exist. Finally, the political implications of some of the strategic management and organizational theories may need to be developed further.

The second major finding was that external economic circumstances had an important effect on the timing of political strategies. Steel firms reacted to the worst economic year, 1982, by filing over a 100 unfair trade petitions. Not only was this level of petitioning unprecedented for the steel industry; it was unprecedented for any U.S. industry to date (Boltuck & Litan, 1991). The intent of the industry was to overload the system so that the government would have to negotiate some sort of restrictive trade agreements with foreign countries (Finger & Murray, 1990: 48). This strategy was unique to the dire circumstances existing during late 1981 and 1982, which included a recession, an overvalued dollar (which encouraged imports), and policies in the European Community that pressured European steel producers to increase exports. Interestingly, 1984, not 1982, was the year of the highest import penetration during this period. This suggests that for petition filings there was an economic threshold related to domestic demand. Interviews with steel lobbyists stressed that firms did not file petitions frivolously, but did so only when they were likely to prevail. The lobbyists revealed that they felt that the industrial recession made their arguments for protection cogent and favorable trade action more likely. Another study (Goldstein & Lenway, 1989) found that industries were most successful in obtaining affirmative escape clause determinations (see footnote 2) when the economy was in a recession. This finding suggests that firms may actively seek protection through administrative trade procedures whenever they believe that trade commissioners are willing to rule favorably for their industry.

However, congressional lobbying did not follow the same pattern. The steel industry had many supporters in both houses of Congress, including an active "Steel Caucus" that sponsored many hearings and drafted several protectionist steel bills, such as the Fair Trade in Steel Act of 1984 (H.R. 5081, S. 2380). Congressional support was undoubtedly important for the steel industry, but perhaps its most important role was pressuring the executive branch for long-term negotiated solutions to imports, such as the voluntary export restraints. Congressional testimony might have been the dominant political routine, broken only by major environmental stress on organizations (Huff et al., 1992), such as depressed demand from the 1981–82 recession, when the administrative trade strategy was used. This pattern may reflect managers' beliefs that the legislative process was too slow and risky to afford protection and that the administrative relief from the International Trade Administration and U.S. International Trade Commission would ensure that some decision would be made within a relatively short time (see Lenway [1985] for description of a similar political calculus by U.S. auto manufacturers).

In summary, the results of the present study clearly suggest two things for the model of corporate political strategy. First, the firms with the largest market shares were consistently the most politically active. This might follow from collective action theory in that managers of large firms anticipated that

they could capture a sufficient share of the collective good created from the implementation of public policy to compensate for the private costs of political action. Additionally, the largest firms may have used political strategies to avoid or postpone the high costs of downsizing. In this sense, political strategies may have served as a substitute for downsizing. The second important result involved the timing and institutional venue of political strategies. The strength of the national economy strongly influenced the timing of the filing of unfair trade petitions, perhaps because political action was most efficacious in influencing trade administrators under poor economic conditions. Congressional lobbying corresponded with high import pressures because legislators may have been most sympathetic to protectionist overtures from industry when they could point to a visible foreign presence in U.S. markets. The results suggest that managers might have strategically calculated the venue for political action on the basis of the anticipated effect of the type and severity of external economic pressure on the receptivity of political actors toward implementing trade policies favorable to the steel industry.

It is likely that managers will continue to devote resources to political involvement. Many U.S. industries face competitive threats from imports similar to that experienced by the steel industry. Political involvement becomes one of the few remaining strategic alternatives for some firms, especially those facing high exit costs. Given the stakes at hand, in sectors in which firms are increasingly subject to global competition, it is necessary from both a firm-level strategic and a public policy perspective to understand the factors that compel a company to seek governmental protection against imports. Yet research on the relationship between the political and competitive strategies of firms remains largely underdeveloped. Although preliminary, this study sets the stage for further systematic analysis by researchers of U.S. managers' political response to foreign competition.

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OCCUPATIONAL STRESS, SOCIAL SUPPORT, AND THE COSTS OF HEALTH CARE

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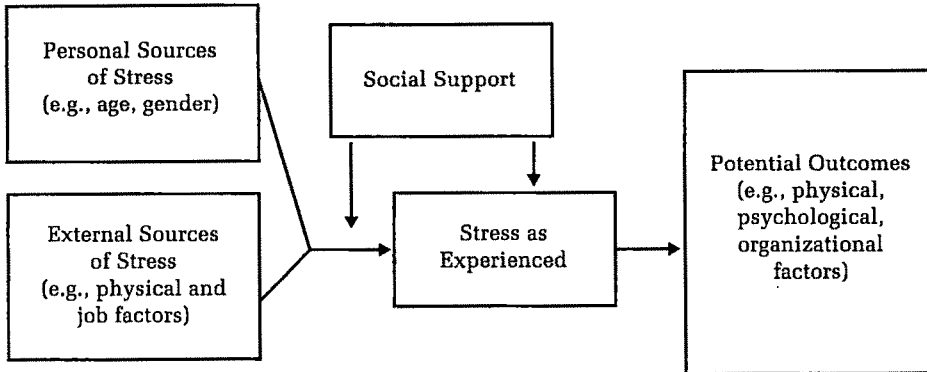
Relationships among health care costs, social support, and occupational stress are investigated. Health care cost data were collected over two years for 260 working individuals. Multiple regression analyses were used to control for initial health care costs, age, and gender in predicting later costs; independent variables were stress, strain, social support, and their interactions. Main effects and interactions each accounted for significant proportions of the variance in various health care costs.

A general presumption of the occupational stress literature is that personal work stress and strain ultimately lead to failing individual health and illness (e.g., Cooper & Marshall, 1976; Fletcher, 1993; Ganster & Schaubroeck, 1991; Greenberg, 1977; Kasl, 1984). Some empirical support exists for this relationship. A recent National Institute of Mental Health document, *Neuroimmunology and Mental Health* (Vitkovic & Koslow, 1994), summarizes literature concerning the relationship between stress and susceptibility to disease. Ganster and Schaubroeck (1991) conducted a review of work stress and employee health and concluded that strong indirect evidence exists that stress causes illness. Those authors also charted the history of research on work and stress.

Organizational and clinical researchers alike are calling for an appropriate and specific model for judging the effects of stress on immune system responses. Although such a model does not currently exist, the findings of the studies cited here generally follow the conceptual framework of Matteson and Ivancevich (1982). Its major parts are outlined in Figure 1. The model suggests that personal (for instance, age and gender) and external sources of stress (in a work setting, these may include physical and job factors) influence stress as experienced, which in turn can affect potential outcomes, with implications for physical, psychological, and organizational factors. Al-

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FIGURE 1
A Simplified Model of Work Stress^a



^aAdapted from Matteson and Ivancevich (1982).

though a lack of social support may influence the experience of stress, the provision of social support may also serve to moderate the stress-strain relationship. That is, having social support may to some extent protect individuals from the negative health effects of stress (LaRocco, House, & French, 1980; Vitkovic & Koslow, 1994).

Although many studies have investigated this model's general line of reasoning, common methods variance is a potential alternative explanation for the reported relationships between stress and health. Over 200 of the previously conducted research studies rely on self-reported perceptions of both stress and health. In addition, the majority of the health measures employed are limited to perceptions of mental health, rather than physical health. Even for those studies that did measure physical health, many researchers again employed self-report checklists of health symptoms (e.g., Karasek & Theorell, 1990). Exceptions to this approach include the Scandinavian research (e.g., Johansson, Aronsson, & Lindstrom, 1978) that has employed objective measures of both work characteristics and physiological outcomes such as neuroendocrine activation levels. Further investigation of the physical effects of stress could lead to a more complete understanding of its health impact.

The purpose of the present investigation was to avoid the limitations of past research in exploring the relationship between work stress and illness. We measured illness with the economic variable of health care costs obtained from archival medical records. These costs may reflect individual health and illness. No previous studies have predicted health care cost data from work stress measures. Empirical documentation of the health care costs and occupational stress relationship may clarify work-health connections.

STRESS AND HEALTH CARE COSTS

Health care consumed 13.2 percent of the U.S. gross national product (GNP) in 1991, up from 9.6 percent in 1981 (U.S. Department of Commerce, 1993: 413). It is estimated that health care will rise to 16 percent of GNP by the year 2000. In reference to the model presented in Figure 1 and in light of the stress literature, work *stressors* may directly and indirectly influence health outcomes, or *strains*. These strains may translate into health care costs if people seek professional treatment to deal with them.

Gibson (1993) documented that 90 percent of medical patients have stress-related symptoms or disorders. He also suggested that health care utilization resulting from stress costs U.S. industries \$68 billion annually and reduces their profits by 10 percent. These estimates, even if approximate, clearly warrant a greater understanding of stress effects on health care costs. In the present study, we investigated three of the more prominent categories of stress-related variables with respect to health care costs: (1) work events—perceptions of an account of specific things that happen in the workplace that may prove to be stressful, (2) subjective perceptions of strain, and (3) social support. Health care costs are divided into these five categories of health care service: doctor's office costs, inpatient hospital costs, outpatient hospital costs, costs of prescription drugs, and other, miscellaneous costs (e.g., laboratory tests, ambulatory services, home health care, etc.).

The general hypotheses tested were,

Hypothesis 1: The magnitude of stressors is positively related to health care costs.

Hypothesis 2: The magnitude of strains is positively related to health care costs.

Hypothesis 3: The number of social supports available to individuals and their satisfaction with them are negatively related to health care costs.

Because the personal variables of age, gender, and previous health care costs may play a role in individuals' experience of stress and strain, we controlled for them in the analyses prior to examining the relationships of interest. Interaction effects on health care costs are also investigated because research (Fox, Dwyer, & Ganster, 1993) has suggested that interactions can contribute to the variance explained in stress reactions. Specific hypotheses are not proposed here concerning the relationships between particular stress variables and types of health care costs. This is because of the largely exploratory nature of this research, given that other studies have not addressed the relationship between stress and health care costs.

METHODS

Participants and Procedures

The respondents were recruited from a small manufacturing division of a large multinational chemical corporation and a large health insurance

company. Participation was voluntary and was solicited as part of a larger research project that evaluated the effectiveness of health promotion programs in work settings. Self-report variables were obtained from a survey administered at the job sites during working hours. Respondents were asked to consider, in general terms, their experiences with the stressors, strains, and social support.

Health care cost data were obtained for each employee directly from archival records held by the health insurer. These cost data were gathered for the 12 months prior to the survey administration and the 12 months afterward. We used this time period for two reasons: (1) a period of this length might be adequate for health manifestations of stress to appear and (2) these were the times at which the organizations would permit us to collect data. Because it is unclear how long potential health manifestations of stress might take, this period of time is an estimate.

Approximately 60 percent of the employees in these firms who were covered throughout the study period by traditional health care policies participated in the study. This percentage included 260 people at all hierarchical levels of the two organizations. There were 143 individuals from the health insurance company and 117 individuals from the manufacturing company. Of these respondents, 128 were managers and 132 were individuals with no supervisory responsibility. Their mean age was 36.88 years (ranging from 21 to 64, *s.d.* = 9.90). For the health insurance firm, 38 of the respondents were men and 105 were women (coded man = 1, woman = 2). The manufacturing company provided 47 men and 70 women.

Respondents were assured of confidentiality in release forms that they all signed. The form also allowed access to their personal health care claim data. Questionnaires were identified with social security numbers, and these were used to coordinate the health care claim data.

Measures

Social support. Social support was measured with the Social Support Questionnaire (SSQ) developed by Sarason, Levine, Basham, and Sarason (1983). The SSQ yields two scores for (1) perceived number of social supports and (2) satisfaction with the social support that is available. Internal consistency estimates for these two scales were .93 and .91, respectively.

Stressful work events. Stressful work events were assessed using the Organizational Readjustment Rating Scale (Naismith, 1975). Respondents indicated which of 30 stressful job events had occurred in the previous 12 months. Following scoring procedures similar to those used by Weiss, Ilgen, and Sharbaugh (1982), we computed a stressful work events score by summing the number of events checked.

Strain composite index. This measure was a combination of scores on the following measures: job-related tensions, job satisfaction (reversed), and negative affect. The composite was created because (1) these measures are conceptually related in that they all measure different potential aspects of

strain and (2) their scores evidenced high intercorrelations on the basis of a factor analysis.

The Job-Related Tension Index (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964) consists of 18 items rated on a seven-point scale (1 = never to 7 = nearly all the time). Job satisfaction was measured by having respondents rate ten items on a seven-point scale (1 = dissatisfied to 7 = satisfied; Manring, 1979). The items are representative of specific aspects of jobs, such as the nature of the task, the quality of supervision, relations with people, and freedom to use personal judgment and initiative. The negative affect scale from the Affect Rating Scale (Sippelle, Gilbert, & Ascough, 1976) was used to measure this construct. This scale consists of eight items anchored on a seven-point rating scale (1 = not at all to 7 = very much). Respondents were asked to determine how well eight words (e.g., fearful, angry, bitter) described their general feelings.

The factor analysis resulted in all three variables loading on one factor that accounted for 70.17 percent of the total variance with an eigenvalue of 2.10. Thus, we computed a job strain composite index by summing the standardized scores for the three variables. The reliability estimate for this index was .78.

Health care costs. Health care costs were determined by actual dollar costs associated with all episodes pertaining to health care claims over the two-year period of the study. The cost data were obtained from insurance records that included all forms of health care typically covered by health insurance programs. Costs were available for the five categories noted earlier: physician office visit costs, hospital outpatient costs, hospital inpatient costs, prescription drug costs, and other, miscellaneous health care costs. Because the categories of health care costs were not normally distributed, we logarithmically transformed these data to attempt to normalize them.

The health care plan for each organization involved 100 percent coverage. Either a patient or a treating physician could submit claims to the insurer. Employees could use any physician they chose.

Evidence (Hafner-Eaton, 1993) suggests that well and chronically ill individuals with health insurance are twice as likely to see a physician for preventive and remedial procedures as those without insurance. Thus, because they were insured, those participating in the present study might have been expected to seek professional care for health problems that arise.

RESULTS

Zero-Order Correlations

Table 1 displays the correlations among the self-report work stress variables and the time 2 costs of health care. As expected, there was some correlation among these measures. However, the magnitude of the observed correlations suggests that these variables are not simply redundant measures and have a good deal of variance not held in common. Many of the measures

TABLE 1
Correlations among Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Gender										
2. Age	-.04									
3. Number of social supports	-.05	-.15**								
4. Satisfaction with social support	.09	-.02	.15*							
5. Stressful work events	-.01	-.19**	.02	-.11*						
6. Strain index	.14**	-.23**	-.09	.34**	.35**					
7. Doctor's office costs	-.05	-.05	-.06	-.07	.14**	.09*				
8. Inpatient hospital costs	.08	-.01	-.01	.02	.08	.06	.24**			
9. Outpatient hospital costs	.08	-.13*	-.10*	-.04	.18**	.16**	.50**	.59**		
10. Prescription drug costs ^a	.08	.15*	-.13*	-.03	-.01	-.01	.39**	.17*	.36**	
11. Other costs	.07	-.07	-.11*	-.09*	.10*	-.19**	.41**	.26**	.46**	.19*

^a Computed for health insurance company only ($n = 143$).

* $p < .05$

** $p < .01$

of health care costs correlate with stressful work events, the strain index, the number of and satisfaction with social supports, and age.

Hierarchical Regression Analyses

We conducted hierarchical regression analyses to investigate the effects of the independent variables and their interactions on each of the dependent variables. On the first step of each analysis, a set of control variables was entered, which included a measure of the health care costs at time 1, age, and gender. The second set of variables entered concerned the main effects of number of social supports, stressful work events, and the strain index. The third set concerned interactions between each of the independent variables and the number of and satisfaction with social supports.

Table 2 displays the regression results. The equation for the dependent variable of prescription drug costs was computed for only the health insurance company, because the drug cost data were not available for respondents from the manufacturing organization. The total R^2 was statistically significant for the dependent variables of doctor's office costs ($F_{18,241} = 5.25, p < .01$), hospital outpatient costs ($F_{18,241} = 3.44, p < .01$), and prescription drug costs ($F_{18,241} = 2.69, p < .01$). The increment to R^2 was statistically significant for the addition of the main effects on the dependent variables of hospital outpatient costs ($\Delta R^2 = .032, F_{4,251} = 2.41, p < .05$) and other costs ($\Delta R^2 = .037, F_{4,251} = 2.52, p < .05$).

The increment to R^2 from step 2 to step 3 was also significant for the addition of the interaction terms in the cases of doctor's office costs ($\Delta R^2 = .056, F_{11,240} = 1.88, p < .05$) and prescription drug costs ($\Delta R^2 = .078, F_{11,123} = 2.62, p < .01$).

Some regression weights were marginally significant ($p < .10$) for the doctor's office costs equation. Although these results do not achieve traditional levels of significance ($p < .05$), we considered it important to identify these marginal results because of the exploratory nature of this study as well as the actual dollar amounts that are associated with health care use. Those regression weights that are part of a step that makes a significant contribution to R^2 are examined.

These marginally significant main effects on doctor's office costs included work events and stressors, which both had positive relationships. Thus, weak support for the second and third hypotheses emerged. Stress and strain appear to be positively related to health care costs. Also, for the dependent variable of doctor's office costs, the following interaction terms were marginally significant (at $p < .10$): (1) number of social supports times gender, (2) satisfaction with social support times work events, and (3) number of social supports times strain. Number of social supports appears to be negatively related to doctor's office costs, and this relationship is more pronounced for men than for women.

For the second interaction, doctor's office costs are relatively unaffected by social support for those experiencing low levels of strain. But these costs

are considerably lower for those experiencing high strain levels under conditions of high social support as opposed to low social support.

The interaction between satisfaction with social support and stressful work events suggested that those with low social support appeared to have greater doctor's office costs when exposed to stressful work events than those with high social support who were similarly exposed. These costs were similar for those with high social support regardless of the level of work events.

Concerning the dependent variable of prescription drug costs, the regression weight for the main effect of strain was marginally significant ($p < .10$) and positive, suggesting that as the stressors increase, so do the costs. Also marginally significant ($p < .10$) was the interaction term for satisfaction with social support times prescription drug costs at time 1. Those with low satisfaction with social support tended to have slightly higher prescription drug costs at time 2, regardless of the level of drug costs at time 1.

DISCUSSION

Even though this study was exploratory, results suggest that individual medical responses are related to job stress. After controlling for time 1 health care costs as well as age and gender, we found that main effects of stress and social support and their interaction accounted for 9 percent of the variance in prescription drugs, 7.8 percent of the variance in both doctor's office costs and other costs, and 7 percent of the variance in hospital outpatient costs. The fact that direct dollar costs are associated with these health care expenses underscores the importance of these findings.

These results appear to be consistent with the psychosomatic literature (e.g., Holmes & Rahe, 1967). This perspective posits that a concentrated experience of stressful life events and resulting strain will be related to (and likely result in) the onset of disease and illness. When too much adaptive energy is required of an individual in a given time frame, the individual's immune system breaks down and disease is imminent. Extending this logic, individuals who have more illnesses should tend to incur more health care costs.

Stressful events have been deemed important in the job stress literature for some time now. Numerous studies have reported relationships between stressful work events and outcomes such as perceived stress and strain (Koch, Tung, Gmelch, & Swent, 1982; Naismith, 1975), lowered performance (Motowidlo, Packard, & Manning, 1986), and absenteeism (Manning & Osland, 1989). The findings of the current study extend the stressful work events literature to the economic costs of health care claims.

In the present study, the hypotheses concerning the relationship between stress, strain, and health care costs were supported for the dependent variable of doctor's office costs. Furthermore, the strain-health care cost hypothesis was supported for prescription drug costs. Although the hypothesized social support main effects were not supported, we found interactions. These concern the effect of social support in conjunction with stressors in affecting

TABLE 2 (continued)

Independent Variables	Health Care Cost Dependent Variables, Time 2											
	Doctor's Office			Hospital Inpatient			Hospital Outpatient			Prescription Drug ^a		
	b	R ²	ΔR ²	b	R ²	ΔR ²	b	R ²	ΔR ²	b	R ²	ΔR ²
Number of social supports × age	0.01			0.01			0.01			-0.01		0.01
Satisfaction with social support × work events	-0.07 [†]			0.03			0.01			0.04		-0.02
Satisfaction with social support × strain	-0.10			0.02			0.12			-0.10		-0.06
Satisfaction with social support × gender	0.33			-0.28			-0.72			-0.36		-0.36
Satisfaction with social support × age	0.02			-0.01			0.02			0.01		0.02
Number of social supports × dependent variable, time 1												
Satisfaction with social support × dependent variable, time 1	0.01			-0.03			-0.01			-0.01		0.04
	0.07	.282**	.056*	0.02	.044	.023	0.12	.204**	.038	0.24 [†]	.281**	.078**
											0.04	.104 [†]
												.041

^a Computed for health insurance company only (n = 143).[†] p < .10

* p < .05

** p < .01

health outcomes. In general, higher social support tends to be associated with lower health care costs. These relationships were more pronounced for men and for those experiencing high stress and strain levels. The gender effect is consistent with previous research suggesting that men and women may use support differently (Fusilier, Ganster, & Mayes, 1986).

Interestingly, high strain accompanied by high social support was associated with a much lower level of costs than was apparent under the low strain condition. This finding suggests that some stress, if coupled with social support, may result in a healthy level of arousal. Medical attention thus may not be sought for the effects of positive stress. Social support may be key to the individual's interpretation of these strains as "eustress" rather than distress.

The marginally significant ($p < .10$) interaction between satisfaction with social support and work events suggests that high social support tends to neutralize the effect of stress on doctor's office costs. That is, under conditions of high social support, costs are only slightly higher for the group with a high number of stressful work events than for the group with a low number of such events. When social support was low, however, those experiencing a high number of stressful work events tended to have higher costs than those with low levels of work events. Thus, the findings are generally consistent with previous literature reporting that social support tends to mute the detrimental effects of stress on health.

Given this evidence that work stress is related to the costs of health care (or illness), it seems important that further research clarify this relationship. Two possible strategies that might allow future research to reach stronger conclusions are the following: (1) Greater control over stressors could be implemented. Experimental manipulation of such a variable, however, would raise significant ethical questions about the treatment of human subjects. (2) A better alternative might be use of longitudinal studies employing repeated measures. Such studies, which would allow researchers to have statistical control as well as the ability to assess cause and effect, would likely substantially extend the present exploratory results.

One important limitation of this study was its measurement of stressors as discrete events only, without accounting for the impact of chronic exposures such as work overload or lack of control. In addition, the measurement of job stressors employed represents a very general approach, likely missing job events that are unique to the occupations studied. The effect of these limitations may be a conservative estimate of the true relationship between occupational stress and health care costs. Future research could consider these limitations.

The primary contribution of the present study is the evidence for the connection between stress and health care costs. Given the magnitude of these costs for most organizations, identification of any contributing factor may be useful in a firm's strategic attempts to maintain cost competitiveness. In addition, a greater understanding of the stress and health care cost relationship should help reveal how to enhance the physical well-being and health of individuals in organizational settings.

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AGENCY THEORY AND VARIABLE PAY COMPENSATION STRATEGIES

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This study used a sample of middle-level managers to investigate the effects of organization-level agency-theory-based variables on the proportion of variable compensation that managers receive. Level of task programmability was associated with an increased use of variable pay, and long-term relationships between an agent and principal were associated with decreased use. Results supported the classical organization-theory prediction that under higher risk, organizations use higher proportions of variable pay; but results question agency theory's ability to predict compensation strategy for middle-level managers in the high-risk situation.

Agency theory is an outgrowth of research on risk sharing conducted by economists (Boyd, 1994; Eisenhardt, 1988; Gomez-Mejia & Balkin, 1992a; Lambert, Larcker, & Weigelt, 1993). According to agency theory, each firm consists of a principal (in our study, an organization) and an agent (in our study, a manager). The assumptions of agency theory are that agents are motivated by self-interest, are rational actors, and are risk-averse. Therefore, principals can motivate agents by controlling their incentives (Amernic, 1984; Eisenhardt, 1989; Gomez-Mejia & Balkin, 1992a, 1992b). An agency dilemma occurs, however, when a principal is unable to adequately monitor or assess an agent's behavior (Amernic, 1984; Lambert et al., 1993). This situation results when the agent's task is less programmable (Eisenhardt, 1989), when accomplishing the task entails risks, or when the goals of the principal and agent are in conflict. In this study, we developed and tested hypotheses about the relationship between the use of variable pay incentives for managers and three variables that are prominent in classical agency theory: task programmability (when it is low, an agent's behavior is difficult to monitor); risk (which occurs when an organization is undergoing rapid change); and the length of the agent-principal relationship (when it is long-lasting, the goals of the principal and the agent are aligned) (cf. Alchian & Demsetz, 1972; Eisenhardt, 1989).

Eisenhardt (1989) suggested that it is appropriate to use agency theory to examine internal compensation schemes. However, most agency theory research has focused on top executive compensation (Balkin & Gomez-Mejia, 1990; Beatty & Zajac, 1994; Gerhart & Milkovich, 1990; Westphal & Zajac, 1994), and there has been little research testing agency theory predictions for middle managers. One of this study's contributions is its application of agency theory constructs to the variable pay experience of middle managers.

Organizations have considerable discretion in choosing compensation strategies for their managers (Balkin & Gomez-Mejia, 1987; Gerhart & Milkovich, 1990; Gomez-Mejia & Welbourne, 1988; Lawler, 1981, 1990). There are at least two options: fixed pay (salary) and variable pay (bonus, incentive plans, profit-sharing, ESOPs). Research has shown that such strategies tend to be aligned with (1) the characteristics of industries, such as their technological focus and variation in product demand (Baker, Jensen, & Murphy, 1988; Gerhart & Milkovich, 1990; Mahoney, 1979); (2) the characteristics of organizations themselves (Mellow, 1982), such as the extent and process of their diversification, their strategic business unit (SBU) level strategy, and their life cycle stage (cf. Gomez-Mejia & Balkin, 1992a); and (3) the characteristics of employees, such as their education and skill levels (Becker, 1975). Industry-level and organizational factors, however, are distal and may not be particularly salient to managers. Gerhart and Milkovich (1990) pointed out that other organizational factors may influence compensation contracts for managers. However, they did not identify what those factors might be.

In this article, we draw upon agency theory to develop hypotheses about organizational characteristics proximal to the day-to-day jobs of managers and variable pay compensation schemes. We begin by discussing the agency theory constructs represented by our exogenous variables; we then develop hypotheses regarding their relationships with the proportion of variable pay received by an organization's managers. We also propose a competing risk premium hypothesis related to total cash compensation.

THEORY AND HYPOTHESES

Task Programmability

Agency theorists propose that the fundamental goal of firms is to minimize costs and maximize efficiency. As it relates to compensation strategy, agency theory suggests that organizations choose between fixed and variable pay by determining how easy it is to monitor job performance (behaviors). One factor related to the ability to monitor performance is task programmability.

A programmable task is one whose requisite behaviors can be precisely defined (Eisenhardt, 1989). According to agency theory, task programmability will be positively related to the use of behavior-based compensation contracts (fixed salary) and negatively related to the use of outcome-based contracts (variable pay). This is because programmable tasks allow the principals (in this case, organizations) to specify the behaviors that the agents (in this

case, managers) need to perform. Gomez-Mejia and Balkin (1992b) used the example of work performed by university faculty members to suggest that when work behaviors are inherently nonprogrammable, an organization is forced to monitor behavior by assessing outcomes (e.g., number of publications). Because a principal is actually buying an agent's behavior, it is most efficient to reward the agent for actual behaviors when those behaviors can be efficiently observed and evaluated.

Hypothesis 1: Managers in highly programmable jobs will receive a lower proportion of their compensation in the form of variable pay (bonus) than managers in less programmable jobs.

Organizational Turbulence

One factor that may affect the level of task programmability in an organization is the level of organizational turbulence. Cameron, Kim, and Whetten (1987) defined organizational turbulence as nontrivial, rapid, and discontinuous change in an organization, brought about by events such as restructurings, downsizings, sales and spin-offs of assets, and acquisitions. Because the discontinuity caused by the turbulence disrupts the knowledge of means-ends relationships that exists during more stable periods, it is more difficult for an organization that is rapidly changing and undergoing high levels of uncertainty to specify the behaviors that it needs its managers to perform. Classical organization theory would predict that turbulence will force even organizations in industries in which tasks are highly programmable (e.g., the airline industry) to be more financially flexible and to use ESOPs, bonuses, and so forth (Thompson, 1967). As turbulence increases, a principal must become increasingly flexible. One means of increasing flexibility is to shift from a fixed-salary-based compensation system to one with a higher proportion of variable pay.

Hypothesis 2: Managers in highly turbulent organizations will receive a higher proportion of their compensation in the form of variable pay (bonus) than managers in more stable organizations.

Hypothesis 2, drawn from classical organizational theory (Thompson, 1967), conflicts in part with agency theory's risk premium hypothesis. Although organizational turbulence can be viewed by a *principal* as requiring increased organizational flexibility, it can also be viewed by an *agent* as a high-risk employment situation. In this situation, the agency theory risk premium hypothesis comes into play. This hypothesis predicts that to attract and retain managers in high-risk situations, the principal will be forced to share the cost of risky employment by paying a premium to the agent (Amernic, 1984; Eisenhardt, 1989). The principal will have to increase the agent's overall total level of compensation in order to protect the agent from risk.

Hypothesis 3: Managers in highly turbulent organizations will receive higher levels of total cash compensation (sal-

ary and bonus) than managers in organizations with lower levels of turbulence.

Expected Length of an Agency Relationship

Another factor related to agency theory that may affect a manager's compensation is the expected length of his or her relationship with an organization. Agency theory suggests that in long-term relationships, the principal gains more information about the agent's behavior and therefore can more easily have compensation contracts that are behavior-based (fixed) rather than outcome-based (variable) (Eisenhardt, 1989).

Although the actual tenure of the agent is important, it is possible to extend this argument to the expected tenure of the agent, insofar as the future expectations of the agent and the principal have a role in shaping the compensation arrangements between them. Thus, if both the agent and the principal expect and experience a long-term relationship, agency theory predicts compensation contracts will be less outcome-based (variable) (Eisenhardt, 1989; Lambert, 1983).

When organizations expect relationships with managers to last, they tend to have behavior-based control systems (Sonnenfeld & Peiperl, 1988; Sonnenfeld, Peiperl, & Kotter, 1988). These organizations are interested in socializing their managers into their culture and so tend to emphasize their managers' behaviors rather than the outcomes the managers are accountable for. Organizations that do not expect a long-term relationship to develop, and hence do not expend much effort in socializing their managers, put less emphasis on behaviors and more on actual outcomes and would be expected to place greater emphasis on outcome-based or variable pay. Simply put, when organizations place greater emphasis on longer-term relationships, they face lower perceived risks, and therefore, have less need to rely on variable pay (e.g., the "old" IBM). When long-term relationships decline, risks go up and the organization tends to gravitate toward risk sharing (e.g., the "new" IBM).

One way to identify an organization's expectations regarding the length of its relationship with its managers is through analyzing its human resource policies. Employment security, clear promotion ladders, and investments in training and development are all signals to managers that the organization expects to maintain a long-term relationship with them. Because the principals are better able to monitor and assess the behaviors of their agents in long-term relationships, managers in organizations with human resource policies that encourage such relationships should receive a smaller proportion of their compensation in the form of variable pay than do managers in organizations without such policies (Eisenhardt, 1989; Lambert, 1983).

Hypothesis 4: Managers in organizations with human resource policies that encourage long-term relationships will receive a smaller proportion of their salary in the form of variable pay than managers in organizations without such policies.

Control Variables

A number of other variables at both the organizational and individual levels may also influence managers' compensation in important ways and should be controlled for in any study seeking to test agency theory predictions about compensation (James, Mulaik, & Brett, 1982). At the organizational level, an organization's industry membership (Gerhart & Milkovich, 1990; Mahoney, 1979), size (Deckop, 1988), and performance (Jensen & Murphy, 1990; Leonard, 1990) should be taken into account.

Human capital theory suggests there are also important individual characteristics (Becker, 1975) that may affect individual performance. These include educational level (an index of general skills), organizational tenure (an index of firm-specific skills), job tenure (an index of firm-specific skills), and labor market experience (an index of general skills).

METHODS

The opportunity to conduct this study emerged as a result of our conducting a larger research project on relocated managers in *Fortune* 500 corporations. We selected eight industries (pharmaceutical/hospital supplies, communications, consumer products/food, professional and financial services, retailing, hotel, chemical, and manufacturing) and at least two target companies to represent each industry. Industries were selected to ensure that there would be between-industry variance on the level of organizational turbulence. Information from the general business press was used to make this selection.

Sample

Sample of organizations. The sample of organizations included 20 *Fortune* 500 companies ranging in size from 4,000 to 275,000 employees. The mean number of employees was 65,000, and average annual revenues were \$12.2 billion. Because data were missing on a measure of organizational performance, three organizations were excluded from the study.

Sample of managers. In 1989, we surveyed lower- to middle-level managers who had been transferred by their companies within the previous two years (1987 and 1988). Surveys were mailed to 50 randomly selected managers from each organization. With one follow-up phone call, the response rate was 67 percent ($n = 670$).

We were concerned that, relative to the population of managers in general, our sample might underrepresent singles, women, and managers in dual-career households with children, as a result of discrimination in the allocation of transfer opportunities or self-selection in the acceptance of opportunities to transfer. Therefore, after randomly selecting managers from each firm, we randomly selected as many as 150 other managers from each company's list, and we sent a letter to these people asking them to participate in the study if they fit into one of our special categories. This process made our sample more representative of the population of managers in general and increased the sample by 359 managers, for a total of 1,029 participants.

Two years later, in 1991, we again sent surveys to the homes of our 1,029 respondents. With one follow-up phone call, we received 720 responses, for a response rate of 70 percent. After dropping cases with missing data ($n = 204$), respondents who indicated that they were not in the managerial ranks ($n = 90$), and managers who were no longer with their 1989 employer ($n = 117$), we were left with a sample size of 309 (see Table 1).

Measures

Proportion of variable pay. In the 1991 survey, managers were asked their base salary and individual performance bonus for 1991. We divided

TABLE 1
Demographic Characteristics of Respondents^a

Characteristic	1989 Respondents	Study Sample
Gender		
Male	78%	82%
Female	22	18
Age in 1989	36.5 years	38 years
Education		
High school	3.4%	3.4%
Some college	12.8	12.3
College graduate	61.2	58.5
Master's degree	19.0	22.1
Other degree	2.9	3.6
Marital status		
Married, cohabiting	76.4%	81.7%
Unmarried	23.5	18.3
Number of children	1.0	1.2
Race		
White	95.8%	96.0%
Black	1.6	1.1
Other	2.6	2.9
Functional area		
Sales/marketing	37.1%	31.6%
Engineering	8.9	7.5
Production	8.3	8.7
Research	3.8	3.8
Accounting/finance	10.2	11.6
Computers/systems	4.6	4.2
Administration/HR	12.7	13.2
Other	13.9	14.9
Tenure with 1989 employer	10.3 years	11.4 years
Number of geographic moves	3.9	4.1
Number of employers	2.4	2.5
1989 salary	\$57,752	\$62,210
1989 job level		
Nonmanagement	17.6%	
Lower management	27.0	31.3
Middle management	45.5	58.1
Upper management	9.8	10.6

^a For the 1989 respondents, $n = 1,029$; for the study sample, $n = 309$.

the amount of the bonus by their total yearly cash compensation (salary plus bonus) to obtain the proportion of each manager's annual compensation that was variable. Although we asked respondents for their "individual" performance bonuses, we are not confident that they discriminated among individual, unit-level, and organizational bonuses. To help isolate the hypothesized effects on the proportion of individual performance bonuses, we included organizational performance as a control variable.

Total cash compensation. Total cash compensation was measured on the 1991 survey with two open-ended questions, one requesting base salary, the other requesting bonus compensation. We added results for these two variables together and logged them to decrease heteroscedasticity (Boyd, 1994; Finkelstein & Hambrick, 1989).

Task programmability. Kanter (1977) and others have noted that in general, managers' behaviors are more difficult to define and monitor than those of lower-level employees. Thus, the task programmability measure was operationally defined with three survey questions from Quinn and Staines (1977). Managers were asked to respond to the following statements using a four-point scale ranging from "often true" to "never true": (1) "My responsibilities are clearly defined" (indicating high task programmability), (2) "I can see the results of my work" (indicating the organization's ability to define outcomes), and (3) "I am given a lot of freedom to decide how to do my work" (low organizational ability to define behaviors). Alpha reliability was .77. A high score means high task programmability.

Turbulence. Archival data, summarized in *Predicast's F & S Index, U.S. Annual Editions*, were used to measure the changes the companies in our sample had experienced. All were large organizations whose activities are tabulated regularly by *Predicasts*. We counted instances of changes in the following categories for each organization: reduction in force, sale or spin-off of assets or operations, leveraged buyout, acquisition by another company, merger, joint venture, and attempted takeover. The relevant entries in *Predicast's* for 1989, the year of the first survey, were tabulated and counted (Miles & Huberman, 1984).

We formed an index by first summing the number of incidents in each category and then, because we had no hypotheses about the different categories, summing across categories (Stroh, Brett, & Reilly, 1994). Multiple articles in *Predicast's* about the same change were counted only once. A high score indicated higher organizational turbulence.

To ensure data reliability, we used a second, independent coder to spot-check the content coding and counting. Interrater reliability was 83 percent. To ensure the representativeness of the level of organizational turbulence in our sample of organizations, we selected a second sample of 17 companies, matched as closely as possible to our original sample in terms of industry membership, annual sales, and number of employees. The level of organizational turbulence was coded in the same way for this sample. There was no significant difference in the levels of turbulence in our two matched samples

($t = 1.80$, $p > .10$), leading us to conclude that the level of turbulence in our analysis sample was representative.

Length of the agency relationship. Differences in the expected length of the relationship between the agent and the principal were measured with survey questions in which managers were asked about their career experiences with their organizations. The variables used for this index were the organizational loyalty scale (Patchen, 1965), the career loyalty scale (Reilly, Brett, & Stroh, 1993), and a series of questions related to human resource policies. The responses to these questions were measured on a five-point Likert scale ranging from "strongly agree" to "strongly disagree." The questions included "This division shows real concern for its people," "In this division, people are treated as more important than things," "Employees are carefully trained and developed over time in this division," "This division has extensive employee and management training and development programs," and "The job security is good." Items were worded to draw attention to divisions because many organizations in our sample were multidivisional. "Division" questions asked about the company's practices, and "company" questions asked respondents about their relationships with their companies. The index also included the number of years a manager expected to work for a company.

To measure the length of the relationship, we used the entire 1989 data set ($N = 1,029$ managers). First, an index was constructed for each manager participating in the 1989 survey. Since the items composing the index were on different scales, items were transformed into Z-scores. The coefficient alpha for the index was .81. High (positive) values corresponded to a long-term relationship between the manager and the organization. Second, we conducted an analysis of variance on the entire sample of 1,029 managers to confirm that different organizations had different means for the expected length of the agency relationship (cf. James, 1982). This analysis showed that managers' career patterns were more similar within than between organizations. The index was then aggregated to the organizational level. Third, managers were assigned their organization's average for the length of relationship index. An aggregation is justified, according to James (1982), when the variable of interest is an organizational policy rather than a construct that exists only at the level of individual perceptions. Our operational definition presumes that organizations' human resources strategies are reflected in the career experiences of their managers. By reporting on their experiences with their organizations, our respondents acted as key informants concerning the expected length of the agency relationship. Because we asked about the respondents' actual experiences and not their organizations' espoused policies, we measured this organization-level agency theory construct as "realized" human resource strategies (Mintzberg, 1985).

Control variables. Industry membership was denoted by dummy variables corresponding to an organization's primary industry. We chose the manufacturing industry as the reference category and excluded it from regression analyses in order to avoid a singular matrix. The other industry dummy

variables are therefore interpreted relative to the manufacturing industry (Kerlinger & Pedhazur, 1973).

Organizational size was measured as the natural logarithm of the number of employees, which was obtained from a human resources liaison in each organization.

Organizational performance was measured by an index composed of an organization's return on equity and its return on assets for 1989 (obtained from COMPUSTAT tapes), along with division managers' ratings of corporate performance. The division managers rated corporate performance relative to their industry on four dimensions from Khandwalla (1977): long-run profitability, growth rate of sales or revenues, financial strength, and public image. The response format was a five-point Likert scale ranging from "very good" to "very poor"; the coefficient alpha for this scale was .73. We transformed the three components (ROE, ROA, and division managers' ratings) into Z-scores and then them averaged to form an index of organization performance.

The educational level of the respondents was measured on a six-point scale ranging from "high school" to "M.D., J.D., Ph.D., or other professional degree." Organizational tenure, job tenure, and labor market experience were measured by open-ended questions. Management level was measured by a four-point scale ranging from "nonmanagement" to "upper management."

Analysis

We tested our hypotheses using hierarchical multiple regression analysis, entering the organizational and individual control variables in the first step of the regression. In the second step, the industry controls were entered. In the third step, task programmability, organizational turbulence, and expected length of the agency relationship were entered.

RESULTS

Table 2 presents results for the analysis of the proportion of variable pay managers received (variable means and standard deviations are available upon request). Model 1 regressed the proportion of variable pay on the organization- and individual-level control variables. This model was significant ($F_{7,301} = 2.59$, $p < .01$, adjusted $R^2 = .04$). Next, in model 2, the industry-level controls were entered. The overall model was significant ($F_{14,294} = 7.57$, $p < .01$, adjusted $R^2 = .23$), as was the change in R^2 ($\Delta R^2 = .21$, $\Delta F = 11.83$, $p < .01$). Finally, in model 3, the study variables were entered. The model was significant ($F_{17,291} = 7.76$, $p < .01$, adjusted $R^2 = .27$). The addition of the study variables resulted in another significant improvement in R^2 ($\Delta R^2 = .04$, $\Delta F = 6.62$, $p < .01$).

Table 3 presents results for the analysis of the risk premium hypothesis (total cash compensation). Model 1 regressed logged total cash compensation on the organization- and individual-level control variables. This model was significant ($F_{7,301} = 3.74$, $p < .01$, adjusted $R^2 = .06$). Next, in model 2, we entered the industry-level controls. The overall model was significant ($F_{14,294} = 3.83$, $p < .01$, adjusted $R^2 = .11$). The change in R^2 was also significant

TABLE 2
Results of Regression Analysis for 1991 Variable Pay as a Proportion of Total Compensation^a

Variables	Model 1 β	Model 2 β	Model 3 β
Organizational performance	.00	.01	.04**
Organizational size	.00	.00	-.00
Experience	-.00	.00	.00
Organizational tenure	-.00	-.00	.00
Job tenure	.01	.00	.00
Education	.00	.00	.00
Level	.02**	.02**	.02**
Chemical		-.01	.03
Financial		.22**	.25**
Pharmaceutical		.06**	.10**
Retail		.05*	.18**
Hotel		.03	.07**
Communications		-.02	-.02
Consumer products		.10**	.09**
Task programmability ^b			-.01*
Turbulence ^c			.02**
Expected length of agency relationship ^d			-.05**
Multiple R	.24	.51	.56
R^2	.06	.26	.31
Adjusted R^2	.04	.23	.27
Change in R^2		.21**	.04**
F	2.59**	7.57**	7.76**
df	7,301	14,294	17,291

^a $N = 309$. The coefficients reported show differences in variable pay as a proportion of total compensation for a one-standard deviation change in continuous predictor variables. The coefficients for the industry dummy variables report differences in variable pay as a proportion of total compensation between the focal industry and manufacturing.

^b A high value means higher task programmability.

^c A high value means higher levels of turbulence.

^d A high value means longer organizational tenure.

* $p < .05$

** $p < .01$

($\Delta R^2 = .07$, $\Delta F = 3.69$, $p < .01$). Finally, in model 3, the study variables were entered. The addition of the study variables did not result in a significant improvement in R^2 ($\Delta R^2 = .01$, $\Delta F = 1.35$, $p < .26$).

The results shown in Table 2 support Hypothesis 1: In organizations with high levels of task programmability, there was less use of variable pay ($\beta = -.01$, $p < .05$). A one-standard-deviation increase in the level of task programmability was associated with a one percentage point decrease in the proportion of variable pay. As predicted by agency theory, organizations appear to be using variable pay as an incentive to align the goals of their managers to those of the organizations when tasks are less programmable.

Hypothesis 2 was also supported. Managers in organizations with high levels of turbulence received a higher proportion of their compensation in

TABLE 3
Results of Regression Analysis for 1991 Total Cash Compensation^a

Variables	Model 1 β	Model 2 β	Model 3 β
Organizational performance	.03	-.12	-.17
Organizational size	-.13**	-.09	-.01
Experience	.03	.04	.04
Organizational tenure	.08	.06	.05
Job tenure	-.04	.01	.05
Education	.06	.03	.04
Level	.14**	.17**	.17**
Chemical		-.01	-.08
Financial		-1.25**	-1.24**
Pharmaceutical		.25	.15
Retail		-.32	-.64
Hotel		-.10	-.30
Communications		-.13	-.13
Consumer products		.06	.04
Task programmability ^b			-.04
Turbulence ^c			-.10
Expected length of agency relationship ^d			.07
Multiple R	.28	.39	.41
R^2	.08	.15	.16
Adjusted R^2	.06	.11	.12
Change in R^2		.07	.01
F	3.74**	3.83**	3.40**
df	7,301	14,294	17,291

^a The coefficients reported show differences in the logarithm of total compensation for a one-standard deviation change in continuous predictor variables. The coefficients for the industry dummy variables report the differences in total cash compensation between the focal industry and the manufacturing industry. $N = 309$.

^b A high value means higher task programmability.

^c A high value means higher levels of turbulence.

^d A high value means longer organizational tenure.

* $p < .05$

** $p < .01$

the form of variable pay ($\beta = .02$, $p < .01$). A one-standard-deviation increase in the level of turbulence was associated with a two percentage point increase in the proportion of variable pay. That is, in organizations with high levels of uncertainty, the compensation strategies tended to reflect this financial uncertainty. The data support the notion that organizations in turbulent environments have a greater need for more flexible (less programmable) compensation strategies. Therefore, organizations with high levels of uncertainty did show a greater reliance on the use of variable pay to ensure appropriate behaviors in their managers. This finding is consistent with the predictions of classical organization theory (Thompson, 1967).

The competing risk premium hypothesis (Hypothesis 3) was not supported (see Table 3). Total cash compensation strategies did not significantly differentiate managers in turbulent organizations from managers in less tur-

bulent organizations ($\beta = -.10, p < .09$). Consequently, in organizations with high levels of turbulence, the firms were shifting the risk of the turbulent environment to the managers through increased variable pay, instead of sharing the cost of the risk by giving higher total compensation, as was predicted by agency theory's risk premium hypothesis.

Hypothesis 4 was supported (Table 2). An expectation of a long-term agency relationship was negatively associated with the use of variable pay ($\beta = -.05, p < .01$). A one-standard-deviation increase in the expectation of a long-term agency relationship was associated with a five percentage point decrease in the proportion of variable pay. That is (regardless of the size of the organization, which was controlled for), those organizations whose human resource policies and practices supported the development of long-term relationships had compensation strategies that reflected their ability to better monitor and assess behavior, and they were therefore less likely to use variable pay as an incentive to achieve certain behaviors.

The effects of the control variables were primarily consistent with prior theory and research. Higher organizational performance was associated with a higher proportion of variable pay. Management level was more important than tenure with a firm in predicting proportion of variable pay: higher management level was associated with a higher proportion of variable pay. Relative to the manufacturing industry (which was the reference category), the financial, pharmaceutical, retail, hotel, and consumer products industries used a higher proportion of variable pay. Organizational size was not related to the use of variable pay.

DISCUSSION

The results of this study support agency theory predictions that proximal organizational level constructs affect compensation strategies. The level of a manager's task programmability was negatively associated with the use of variable pay: when tasks were less programmable, there was a greater reliance on variable pay compensation. The results did not, however, support agency theory predictions regarding the risk premium hypothesis. When organizations were particularly turbulent, characterized by high levels of risk and uncertainty, they did not buffer their managers' risk by paying them a risk premium (a higher total cash compensation). Rather, our data showed that organizations in which turbulence was greater shifted the financial risk to their managers by paying proportionately higher levels of variable pay. Regardless of whether tasks are programmable or not, in turbulent environments organizations choose to use variable compensation strategies apparently to better deal with their own turbulence-imposed risks. Organizations shift the risk to the managers in the form of variable pay, as predicted by classical organization theory.

The expectation of a long-term relationship between an organization and its managers was negatively associated with the use of variable pay. Our data support agency theory predictions that when such an expectation exists

there is a greater reliance on behavior-based compensation, perhaps because more information about an agent's behavior is available.

Many of the control variables were also associated with variable pay in the expected directions. Thus, high organizational performance was associated with the use of higher proportions of variable pay. This finding could mean that using a variable pay compensation strategy may pay off in terms of an organization's performance. Alternatively, better performers may have more slack resources to distribute to managers as variable pay.

Organizations in the manufacturing industry gave their managers a lower proportion of variable pay than organizations in many other industries. This finding is consistent with the assumption that large manufacturing organizations may be more capital-intensive than other companies and the finding that the capital intensity of an organization's technology is generally inversely related to the use of variable pay (cf. Gomez-Mejia & Balkin, 1992a).

The effects of the human capital variables (labor market experience, organizational tenure, job tenure, and education) were notably inconsistent with prior theory and research. After controlling for other factors, we did not find that these variables were associated with the proportion of variable pay that managers received. This result, too, is reasonable if we suppose that the main role of human capital variables is to sort people into positions, at a certain hierarchical level, in a certain organization, in a certain industry, and so on, and that these position-related factors have more direct effects on the proportion of variable pay that managers receive.

Limitations of the Study

Like all theory-testing studies, this study measured key theoretical constructs indirectly. Behavior-based measures would be useful to validate the results of this study. Also, the sample for the estimate of human resource policies consisted of managers who had recently been relocated by their organizations. Although these managers may have actually provided an excellent view of an organization's human resource policies because they were people who had made a commitment to the organization by accepting a transfer, their use as respondents may also limit the generalizability of the results.

In our study, compensation data for only one year were used to measure the proportion of variable pay managers received. A more reliable measurement would be possible if data for multiple years were combined. In addition, although we asked respondents to report their "individual performance bonuses," they may not have been able to discriminate between individual-, unit-, and organization-level bonuses. However, our use of organizational performance as a control variable helped isolate the effects of the study variables on the individual component of the performance bonus.

Another potential limitation of the study is that variables like organizational size and performance, found to be correlated with top managers' pay in other studies (Deckop, 1988; Jensen & Murphy, 1990; Leonard, 1990), were not correlated with pay in this study. It may be that organizational size and

performance are too distal to have a significant impact on middle managers' pay. Alternatively, our sample organizations may not have been large enough to capture variance in these macro variables that is related to middle managers' pay. We have tried to phrase our hypotheses and findings in a manner consistent with an acknowledgment of this limitation.

Lastly, the sample of managers in the study was not drawn to be representative of industries. In some categories, such as financial services, our less-well-paid sample does not reflect the data from the industry as a whole. This limitation results from our sampling managers who had been transferred. In the financial services industry, these tended to be corporate managers, not investment bankers.

Despite these cautions, the results contribute to the development of methods in compensation research and to understanding of agency theory's power in accounting for middle manager compensation.

Contributions of the Study

Methodological contributions. We define variable pay slightly differently than did Gerhart and Milkovich (1990). Where they defined "pay mix" as the ratio of bonus to salary, we have used the proportion of variable pay to total compensation. We believe that our measurement more accurately captures the construct of interest, which is the level of variability in the compensation package. The properties of proportions are also more attractive than those of ratios: proportions are bounded between zero and one and so are readily interpretable, but ratios range from zero to infinity (i.e., the proportion of bonus to salary for a manager who received a very small salary relative to bonus would be near one but the ratio would be approaching infinity). Therefore, our coefficients have a straightforward interpretation.

A second methodological strength of the study is the lag in time between the measurement of the agency theory constructs and the measurement of managers' compensation. It is likely that there will be some lag before independent variables are reflected in a dependent variable (James et al., 1982). For instance, a manager's compensation in a current year may reflect the previous year's performance, simply because year-end results must be obtained before complete performance data can be compiled. Furthermore, there is likely to be some rigidity in a pay system (Doeringer & Piore, 1971; Leonard, 1990), which makes an instantaneous response to changing conditions unlikely.

A third contribution of this study is the testing of agency theory hypotheses on a sample of middle managers.

Theoretical contributions. The study supports agency theory's predictions relating middle managers' task programmability and the expected length of their agency relationships to variable pay. The study does not confirm agency theory's risk premium hypothesis for middle managers. Instead, the risk shifting hypothesis of classical organization theory was confirmed. Middle managers whose organizations were turbulent received a greater proportion of variable pay, but no greater overall compensation, than

middle managers whose organizations were less turbulent. These results suggest, counter to agency theory, that middle managers do not receive a risk premium when an organization's conditions are turbulent but that instead, the organization shifts that risk to the managers in the form of variable pay. The findings are consistent with work of Balkin and Gomez-Mejia (1987) showing that organizations in turbulent environments have greater risk sharing (are more likely to use variable pay) than those in stable environments and do not compensate for the managers' risk in the form of higher base pay.

Managerial and policy implications. Findings from this study provide important information for those developing or implementing managerial policy. Both the popular press and empirical research are asking how managers' commitment to their organizations can be increased, given the high levels of turbulence in the corporate environment. Findings from our hypothesis on the expected length of an agency relationship show that managers whose compensation is less tied to variable pay *do* expect to stay with their organizations longer. Consequently, organizations that prefer to buy their labor on their internal labor market and also prefer long-term managerial relationships and commitment should implement compensation strategies that rely less on variable pay. The reverse strategy could also be implemented. Organizations that prefer high levels of turnover (to "bring in new blood," perhaps) should implement compensation strategies that have a higher variable pay component.

This same logic would apply to organizations wanting to retain talented managers during times of high levels of turbulence. Findings from this study suggest that middle-level managers do not receive a risk premium during highly turbulent periods. Implementing a compensation package that emphasizes the managers' total compensation package (rather than variable pay) should help to retain talented managers that the organization wishes to retain during these turbulent times.

In conclusion, this study supports, extends, and refutes agency theory. Key agency theory constructs (task programmability, risk premium, the length of the agency relationship) were measured as job characteristics, business strategy (organizational turbulence), and realized human resource strategy. These constructs were related to an important facet of an organization's compensation strategy, the use of variable pay compensation. However, unlike research on upper-level executives, this research did not support agency theory's risk premium hypothesis.

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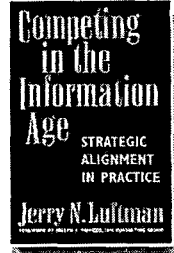
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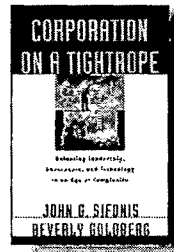
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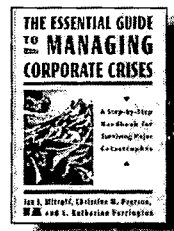
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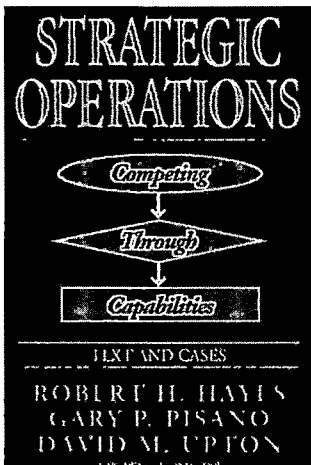
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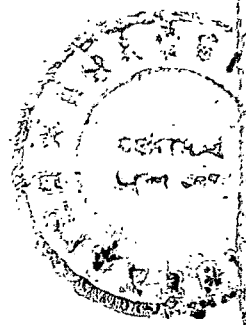
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